Operating instructions

Universal milling machine
UF7- Gearbox



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KUNZMANN milling machines can be initially operated by trained personnel. For CNC machines we recommend that initial operation is carried out by the **KUNZMANN** service team.

When operating and serving **KUNZMANN** milling machines only appropriately qualified people are to be used.
Incorrect use can lead to risk of life and limb, as well as to the destruction of various parts of the machine.

Protective equipment attached to the machines according to the valid accident prevention regulations may not be modified or removed. If this protective equipment fails, the machine may only be used again once said equipment has been repaired.

In the event of a change in the location of the machine or electrical disturbances, contact the **KUNZMANN** service team or arrange for them to visit.

Service and maintenance work may only be carried out when the machine are described in the operating instructions.

Persons contracted with the operation and maintenance of the machine must have read and understood these operating instructions.
In order to avoid injury all activities are to be carried out by one operator.
If necessary, the machine operator should wear protective goggles and protective shoes.

The operating instructions consist of the following sections: machine, control system, electrical equipment, accessories and service.

We accept no liability for damages caused by not observing the specifications in the instructions or by improper procedure

When contacting the **KUNZMANN** service team please always stipulate the machine number.

Here are few tips for operational safety, which are to be especially considered when MILLING.

⇒ Clamp work pieces tight to prevent them from being spun out.

⇒ Before starting work, check the tool is correctly fitted.

⇒ If no extra anti-spray chip protection is available, set up protection or interception walls to protect against flying chips.

⇒ Only remove chips with aids, e.g. paint brush, brush, not with bare hands.

⇒ Add coolant when the milling cutter is at a stand still.

⇒ Do not reach into the danger area of the running milling cutter.

⇒ Only carry out measurements on the work piece or tool changes when milling cutter is at stand still.

⇒ When changing tools, do not grip a stationary milling cutter with bare hands, but always use appropriate protection such as a cloth.

⇒ When jogging or “scratching” a tool, you often come near the running spindle during visual inspection. This is why you must wear a hair net or a suitable cap.

Depending on the operating mode, the risk of an accident is reduced by corresponding safety equipment, e.g. protective doors monitored with limit switches, key operated switches for selecting the setting mode or acknowledge button on the hand wheel etc.

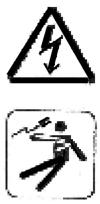
The polycarbonate panes of the cab enclosure are to be exchanged after 7 years due to the reduced protection.

Intended use
The milling machine and processing centres of **KUNZMANN** GmbH enable a range of different metal cutting options, e.g. milling , drilling , tapping.
The materials commonly used in mechanical engineering should preferably be used, e.g. steel grey cast iron and aluminium.
Other material such as paper, graphite, minerals or magnesium cannot be processed or only with appropriate protective equipment.

Attention: Important additional information

Mains connection:

The machine is equipped with a controller in B6 - wiring and may not be connected to a FI-protective switch.



⇒ ***Danger by electrical impact !***

It is absolutely necessary to use a another protective measure after VDE0100 part 410 or IEC 364-5-54 (e.g.: overcurrent release - zero position)!!!

Transportanleitung

Transport instructions

UF6 u.7

Blatt: 2

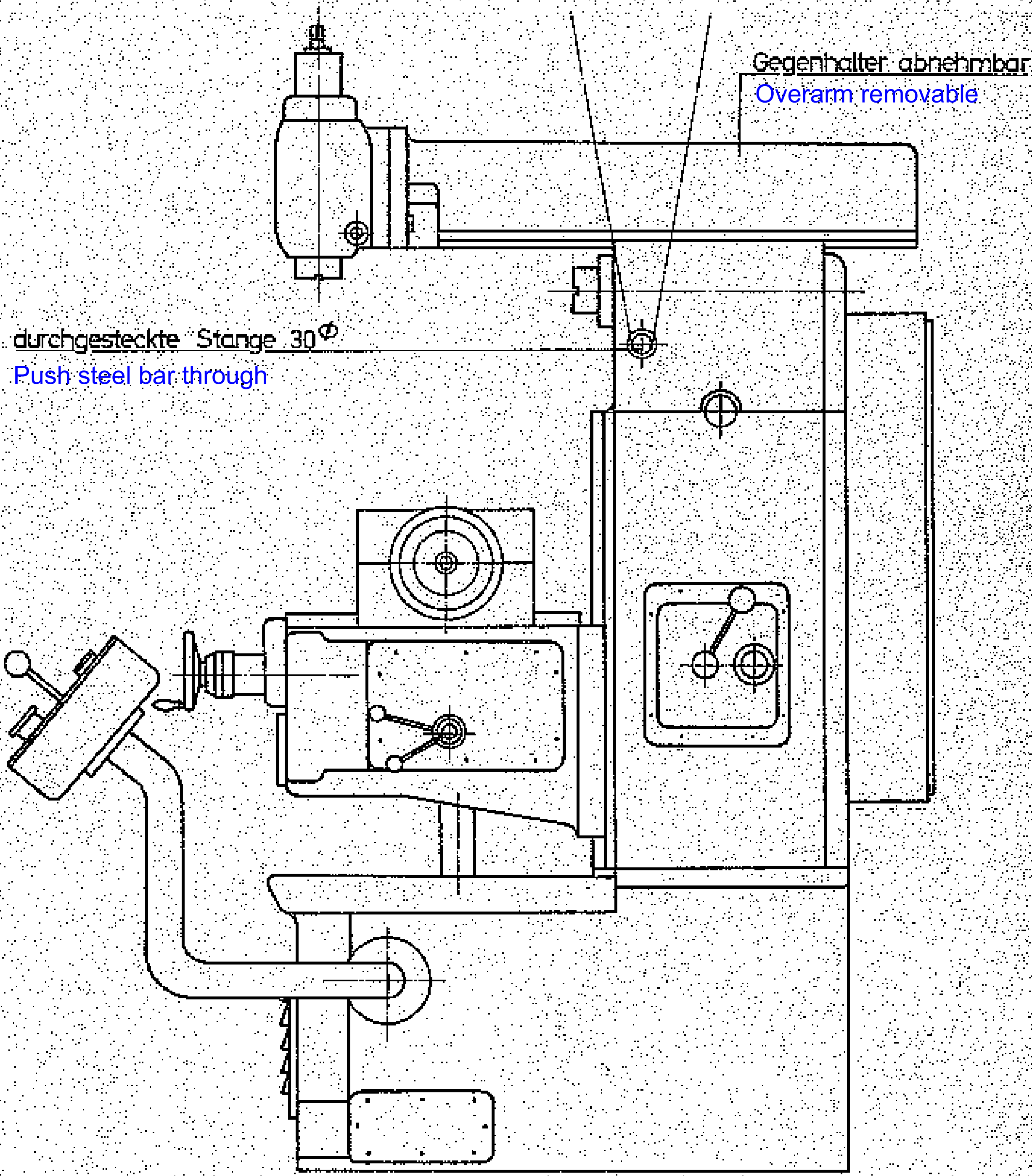
Für den Transport erforderlich:

1 Stck. Rundstahl 30 Φ 600 lang
1 Transportseil zul. Belastung mind. 2000 kg

Required for hauling:

1 Round steel bar, Ø30, 600 long

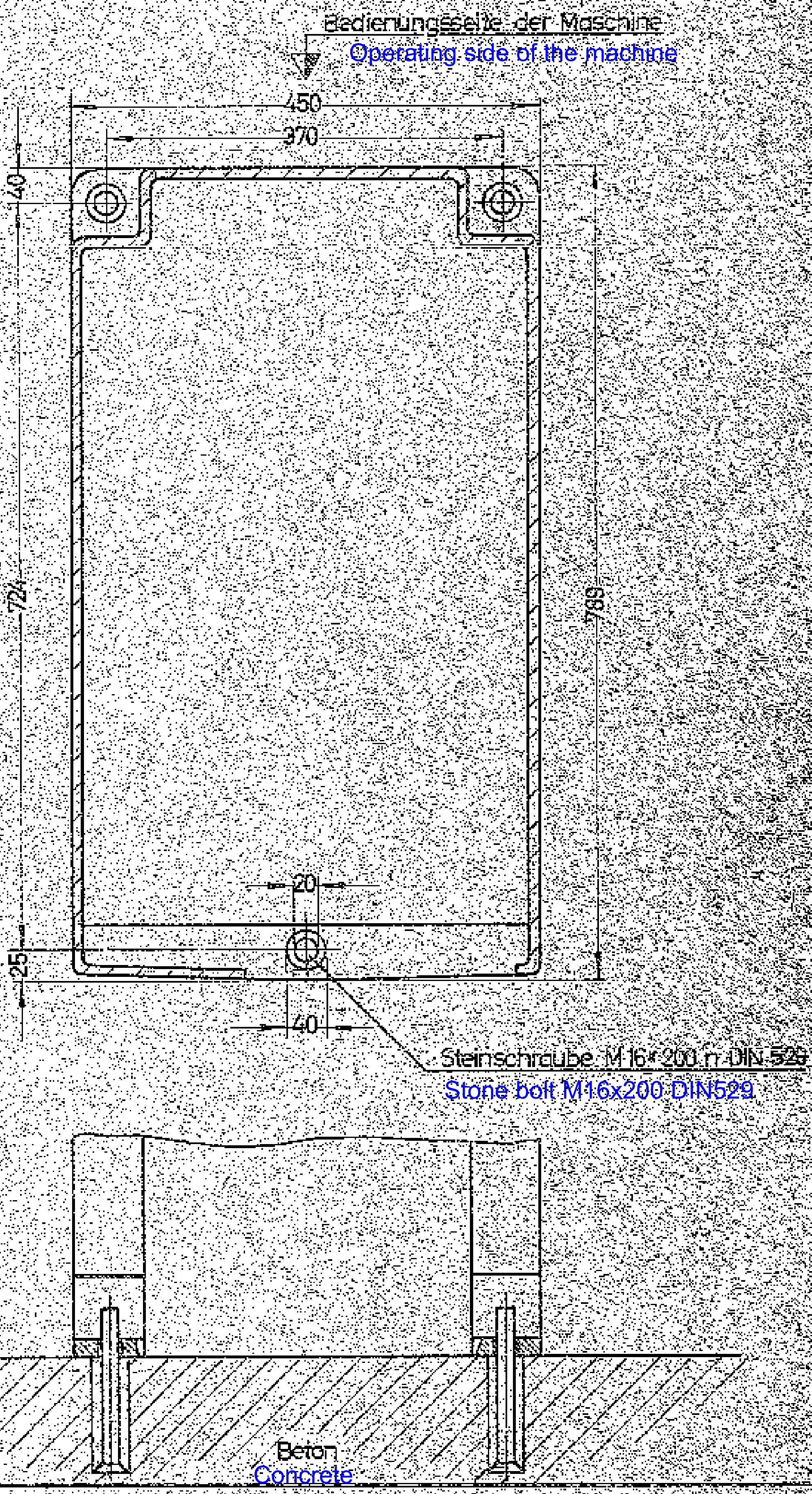
1 Hauling rope admissible load at least 2000kg



Erwin Rudolf Kunzmann Pforzheim - Nöttingen

Fundamentplan
Foundation plan

UF 6, UF 7
VF 6, VF 7
Blatt : 3



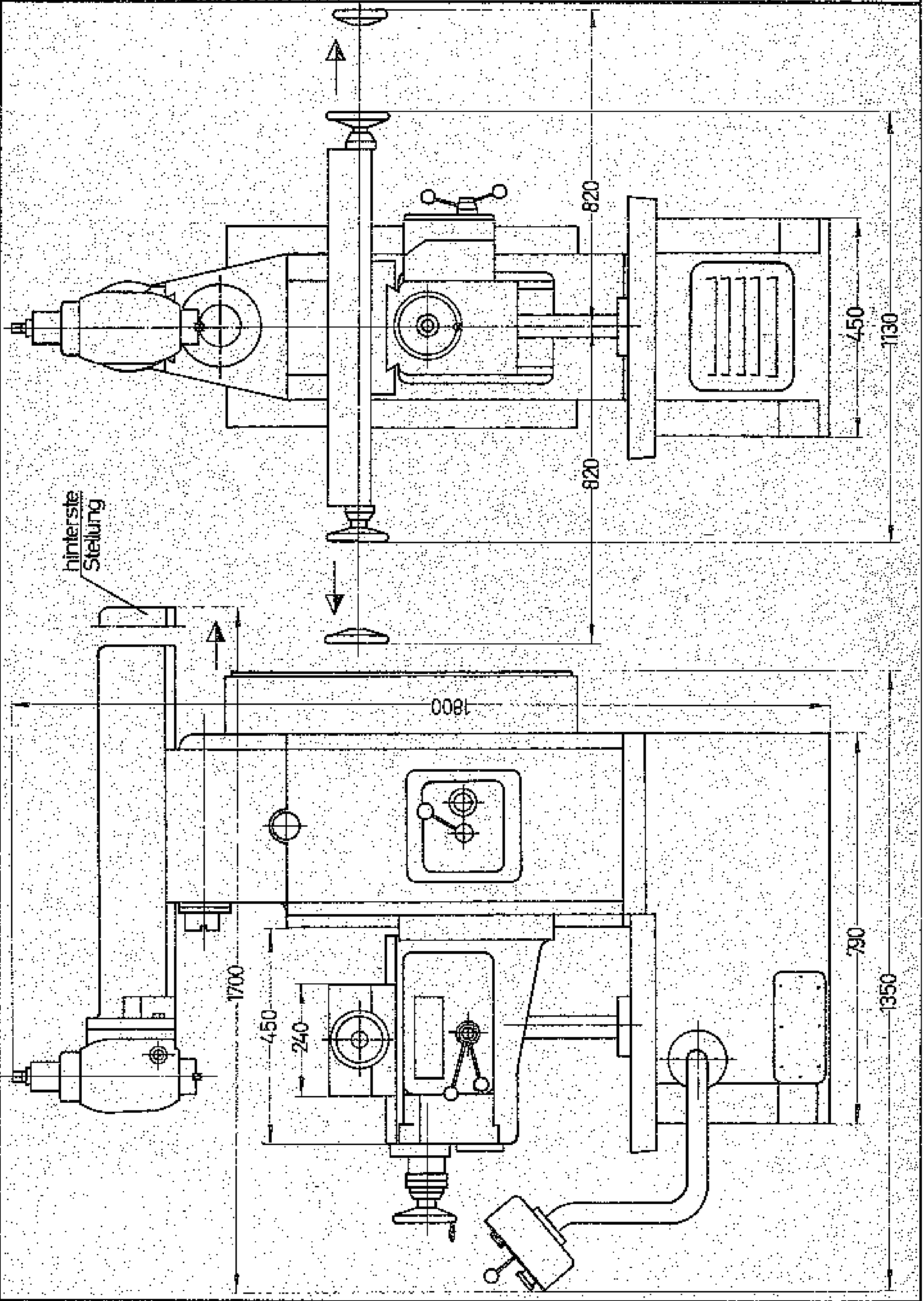
Erwin Rudolf Kunzmann Pforzheim - Nöttingen

Die Abmessungen

(Platzbedarf) Space requirements

UF 7

Blatt: 4



Erwin Rudolf Kunzmann Pforzheim – Nöttingen

Erection

In order to ensure that the machine functions properly it will be absolutely required to place it on a well cured foundation.

> Machines set up without sufficient anchoring are usually subject to undesired vibrations caused by a variety of factors.

Align the machine with a liquid scale in longitudinal and transverse direction.

The anchoring bolts of the accurately aligned machine must be grouted with a cement-sand mixture (at least 1:3). Also, a cement-sand mixture may be applied under the machine base. This, however, is not absolutely necessary.

Mains connection (Most important)

The machine has been laid out in the factory for the operating voltage specified in the order.

The mains connection box is at the machine base. Use steel wire counduit for a cable of at least 5 x 2,5 sqmm.

The green-yellow protective conductor of the connection line must be connected with the appropriate terminal in the connection box.

The other terminals in the connection box are as follows: Mp-RST.

Control voltage and current supply for the magnetic clutches are made available across built-in transformers.

The primary connections and the secondary outlets of the transformer are protected by fuses.

The main motor and the feed motor are provided, at the corresponding contactors, withfusibles to act as overload protection.

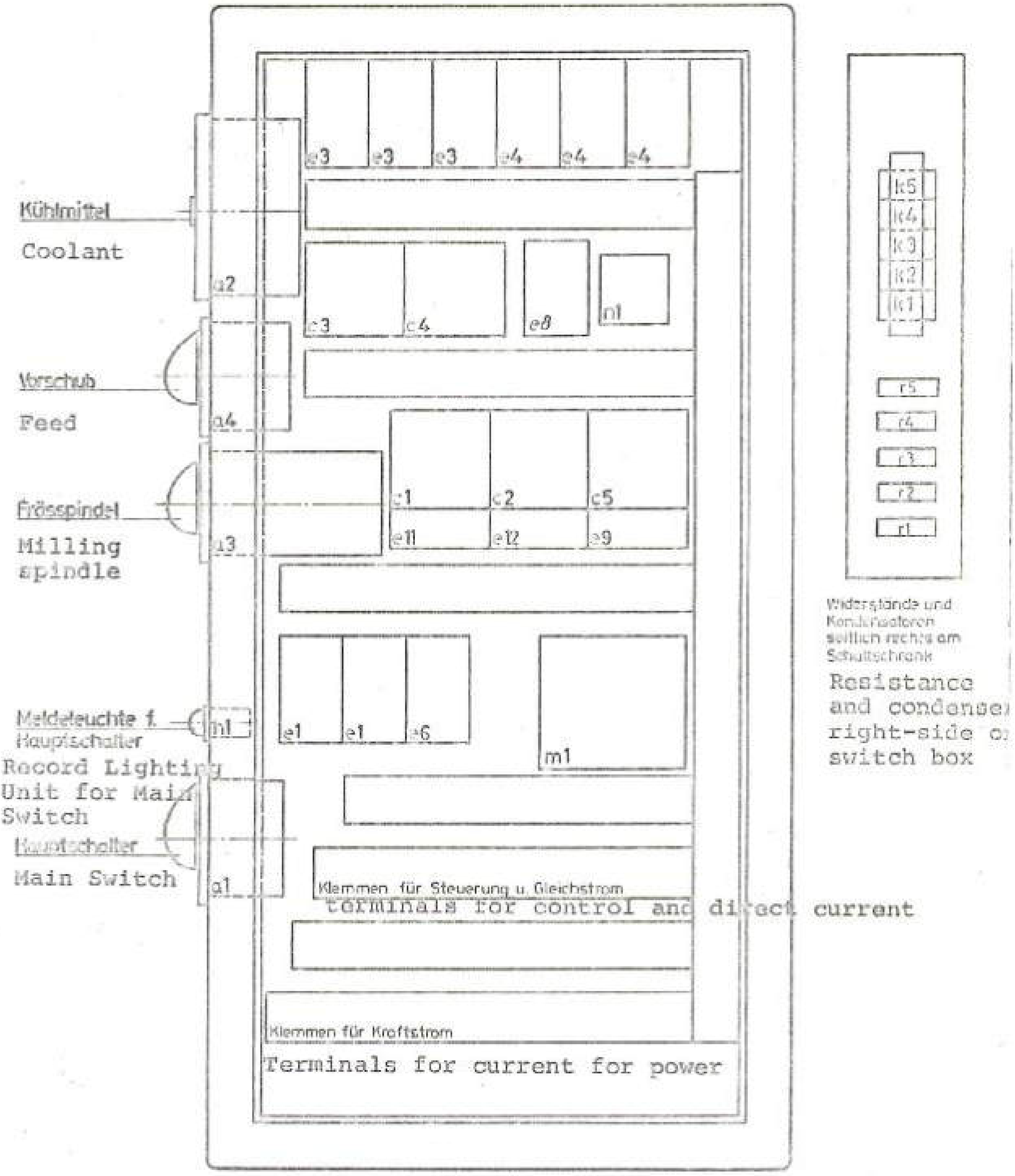
A special motor cutout protects the coolant pump against over-current. Therefore, the coolant pump has no fusibles.

For further particulars kindly attend to the instructions hereafter.

UF7; UF8
VF 7
Blatt: 6

Schaltgeräte im Elektroschaltkasten

Control devices inside the control box



Bitte Anschlußspannung beachten !

Note the operating voltage!

Erläuterungen der Schaltgerätekurzzeichen siehe Blatt 42 u. 43

Explanation of the control unit codes vide page 42 and 43

r5 und k5 entfallen bei UF 7

r5 and k5 do not exist for UF 7

Cleaning and lubrication

All exposed parts are coated with a rust inhibitor. Before starting the machine make sure to remove all rust inhibitor and to lubricate the entire machine in accordance with the individual instructions and the lubrication plan.

It is recommended to use a good machine oil with a viscosity of approx. 3 - 5° Engler at 50° C. For example: Voltol Gleitöl II or another equal product, unless the lubrication plan specifies otherwise.

The roller bearings are lubricated with gease. The manufacturer recommends SKF roller bearing grease (Wälzerol II). The user is free to use any other branch with equal properties.

RED - Grease nipples should be lubricated with oil only.

BLUE - Grease nipples are for grease lubrication only.

Putting to work

When putting the machine to work for the first time, one of the three slowest speeds should be selected at the speed selector to enable the operator to check the proper functioning of the bearings and of the gears.

It is not advisable to start the machine with full load.

The user is recommended to perform all control functions with the machine cautiously before it is put to full use.

Machines equipped with a cooling attachment have the coolant tank in the machine base.

It will be easy to fill the coolant tank after the front cover has been removed.

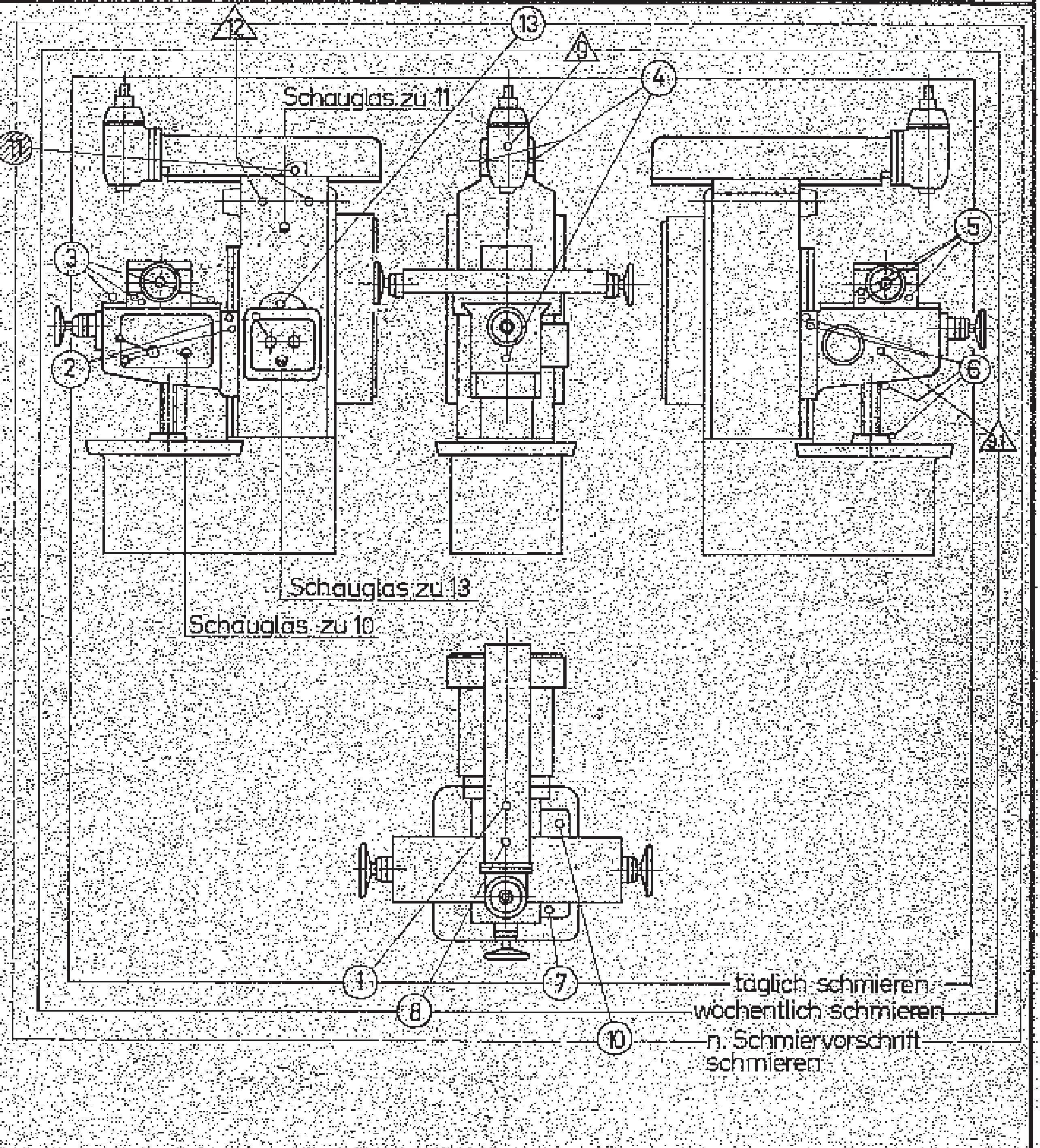
Start the pump only after the tank has been filled.

We also recommend to comply fully with the instructions issued by the coolant pump manufacturer.

It is advisably to study the instructions hereafter and to make all control operations on a training basis without having the machine actuated (Main Switch OFF). Also pay particular attention to the positions and purposes of the limit switches and cams.

Hauptschmieranweisung

UF 7 u. 8
Blatt 8



Schmierstoffübersicht			
DIN Bezeichnung	Werks-Bezeichnung	Zähigkeit	Kennzeichen
Lagerschmieröl BR u. DIN 6543		4,5 E 50	○ rot
Wälzlagerfett B DIN 6562			△ blau
Getriebeöl		SAE 90	◍

Schmiervorschrift			
Schmier-häufigkeit	Schmierstelle Nr	Schmierstoff-menge	Bemerkungen
täglich	1 – 7	3–4 Hübe der Schmierpresse	
wöchentlich	8	4–6 Hübe der Schmierpresse	
wöchentlich	9 u. 9.1	3–4 Hübe der Fettschmierpresse	
alle 6 Monate	10 – 11	bis z. Ölstands-marke nachfüllen	
alle 6 Monate	12	mit Wälzlagerfett füllen	
alle 6 Monate	13	Öl erneuern	

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1 Inspection glass for 11
2 Inspection glass for 13
3 Inspection glass for 10
4 Lubricate daily
5 Lubricate weekly
6 Lubricate according instructions below

7 Summary of lubricants

DIN Description	Works description	Viscosity	Key Symbol
Bearing lubricating oil BKa DIN 6543		4.5° E50°C	red
Roller bearing grease B DIN 6562			
Gear Oil		SAE 90	blue

8 For oil change, vide page 18 and 21

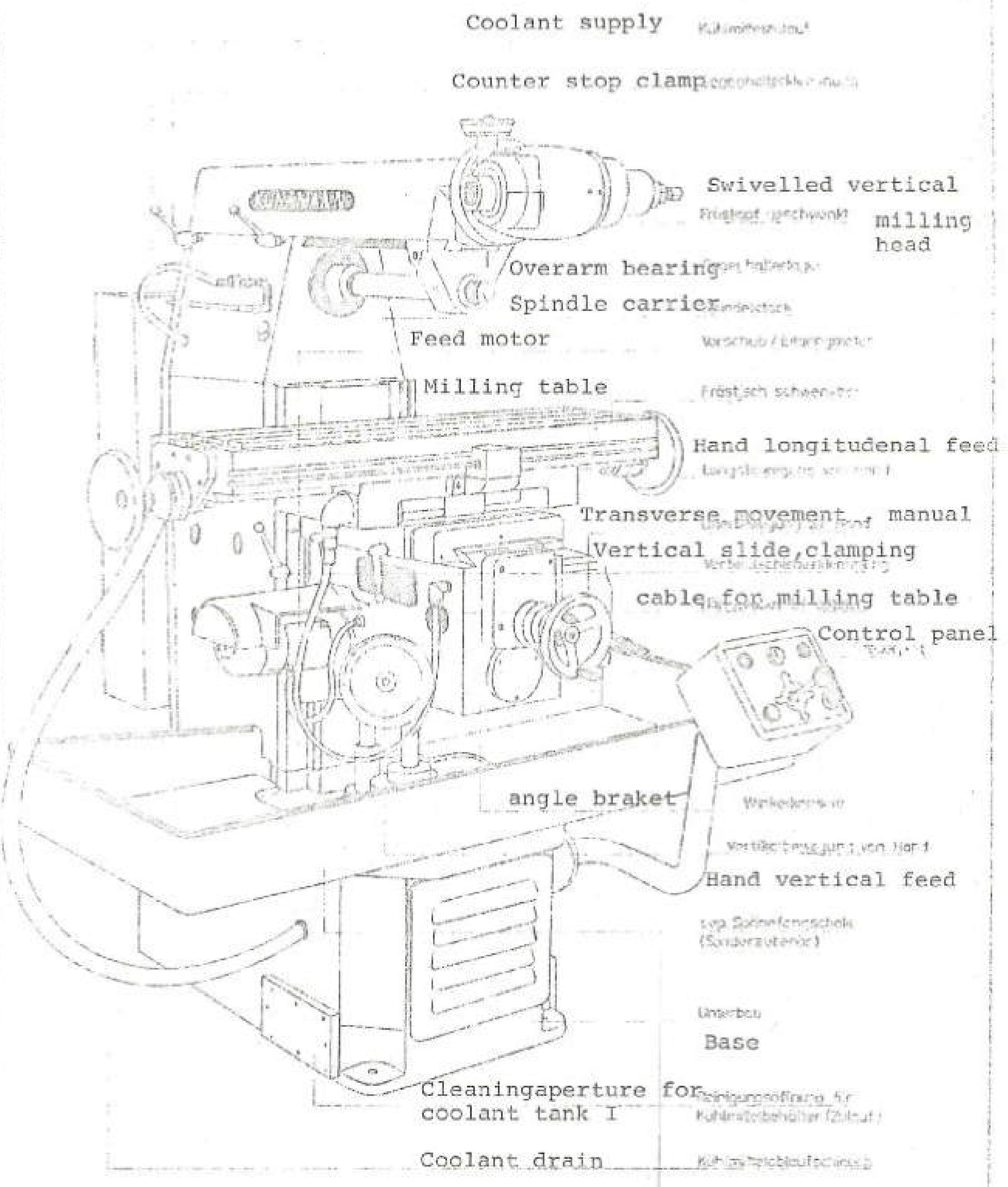
9 Lubricating Instructions

Lubricating Frequency	No. of lubrication point	Quantity of lubricant	Remarks
daily	1 - 7	3 - 4 strokes of gun	
weekly	8	4 - 6 strokes of gun	
weekly	9 & 9.1	3 - 4 strokes of grease gun	
every 6 months	10 - 11	top up to oil level mark	
every 6 months	12	pack with roller bearing grease	
every 6 months	13	re-new oil content	

Bezeichnungen u. Bedienungen I

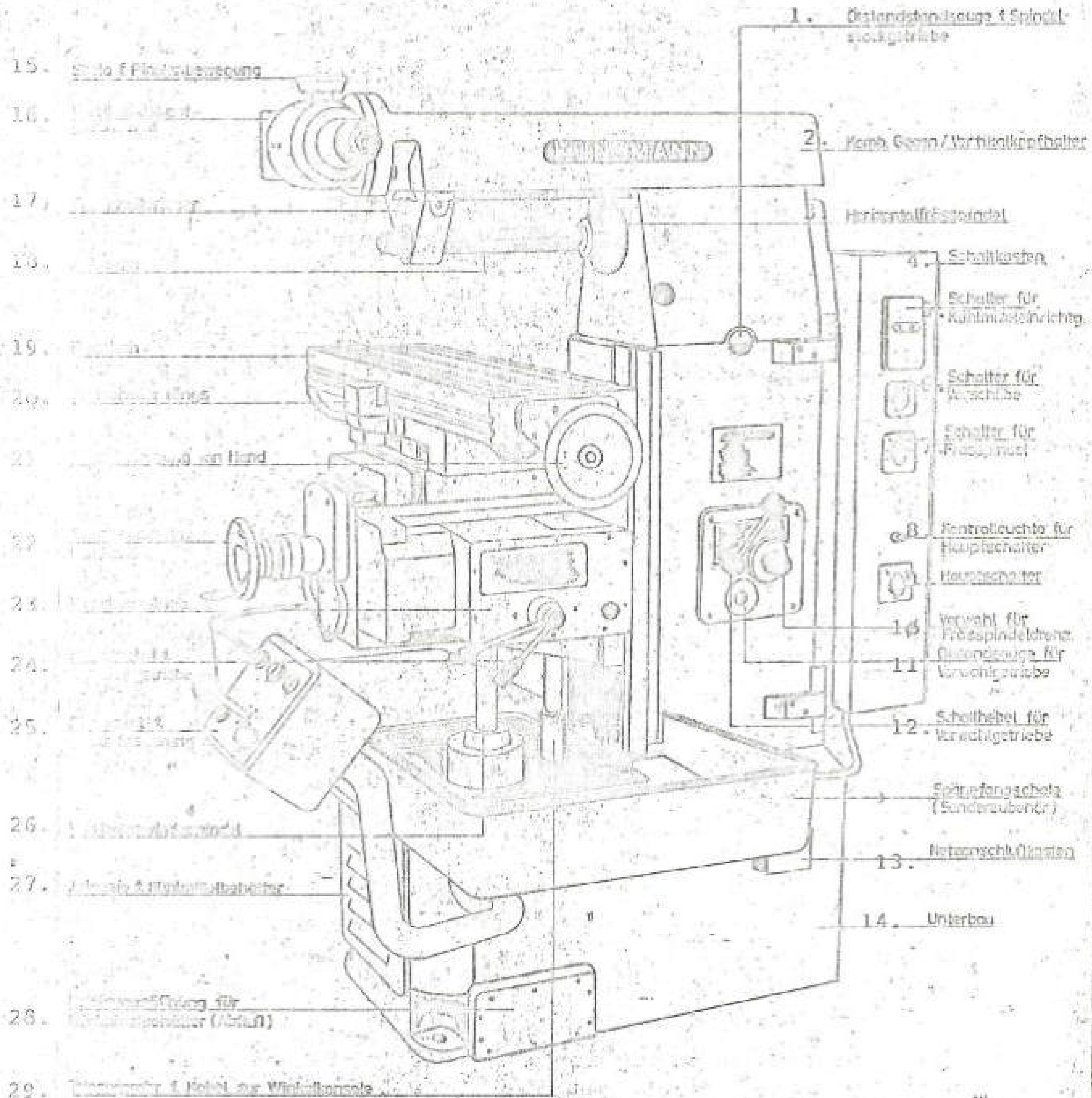
Componant identification and controls I

UF 7



Bezeichnungen u. Bedienungen II

Designations and Operations II



Designations and Operations II

1. Oil sight glass for spindle carrier gear
2. Combines vertical hrad counter stop
3. Horizontal milling spindle
4. Electrical box
5. switch for coolant
6. Switch for feed
7. Switch for milling spindle
8. Control lamp for Master switch
9. Master switch
10. Milling spindle preselector
11. Oil sight for gearbox
12. Switch lever for gearbox (Milling spindle)
13. Mains connection box
14. Base
15. Scala for vertical milling spindle
16. Vertical milling head (swivelled)
17. Counter stop bearing for support journal
18. Cutter arbor
19. Milling table
20. Longitudenal limit switch
21. Hand longitudenal feed
22. Hand traverse feed
23. Table feed gear
24. Switch lever for gearbox (feed)
25. Control panel
26. Vertical threaded spindle
27. Front plate for coolant tank
28. Cleaning trap for coolant tank
29. Cable conduit

OPERATING INSTRUCTIONS

(electrical)

1. Switch in main switch a1 to I, hereafter control lamp h1 must give light.

2. Adjust direction of rotation and number of revolutions for milling spindle motor on switch a 3.

3. When working with feed adjust thereafter also number of revolution of the feed motor on a 4 (I or II).

4. Cooling pump can be switched on,too, after pourring cooling liquid in both containers of the substruction.

   All switchgears mentioned up to now are situated laterally on the switchgear box which is on the backside of the machine.

5. Milling spindle can be switched on,with switch b 8 on the control panel.

6. Adjusting of the desired feed- respectively rapid traverse direction on the multi directional feed control switch.

7. Press either button b 6 (feed EIN) or button b 7 (rapid traverse EIN) so that milling table moves in the desired direction, provided that feed gear has been switched on before.

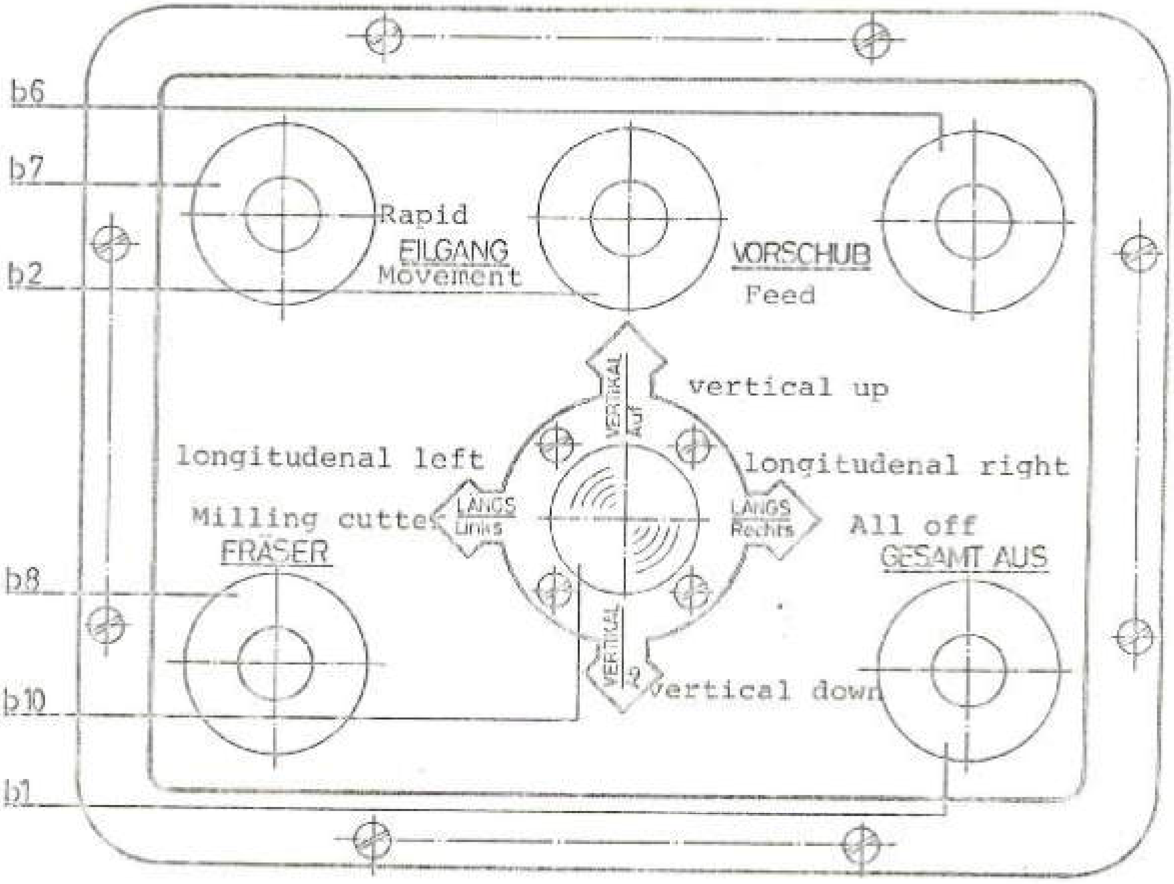
8. In any position the feed, whether longitudinal or vertical can be stopped by pressing button b 2 or button b 1. The rapid traverse is only as long in operation as button b 7 will be pressed manually.

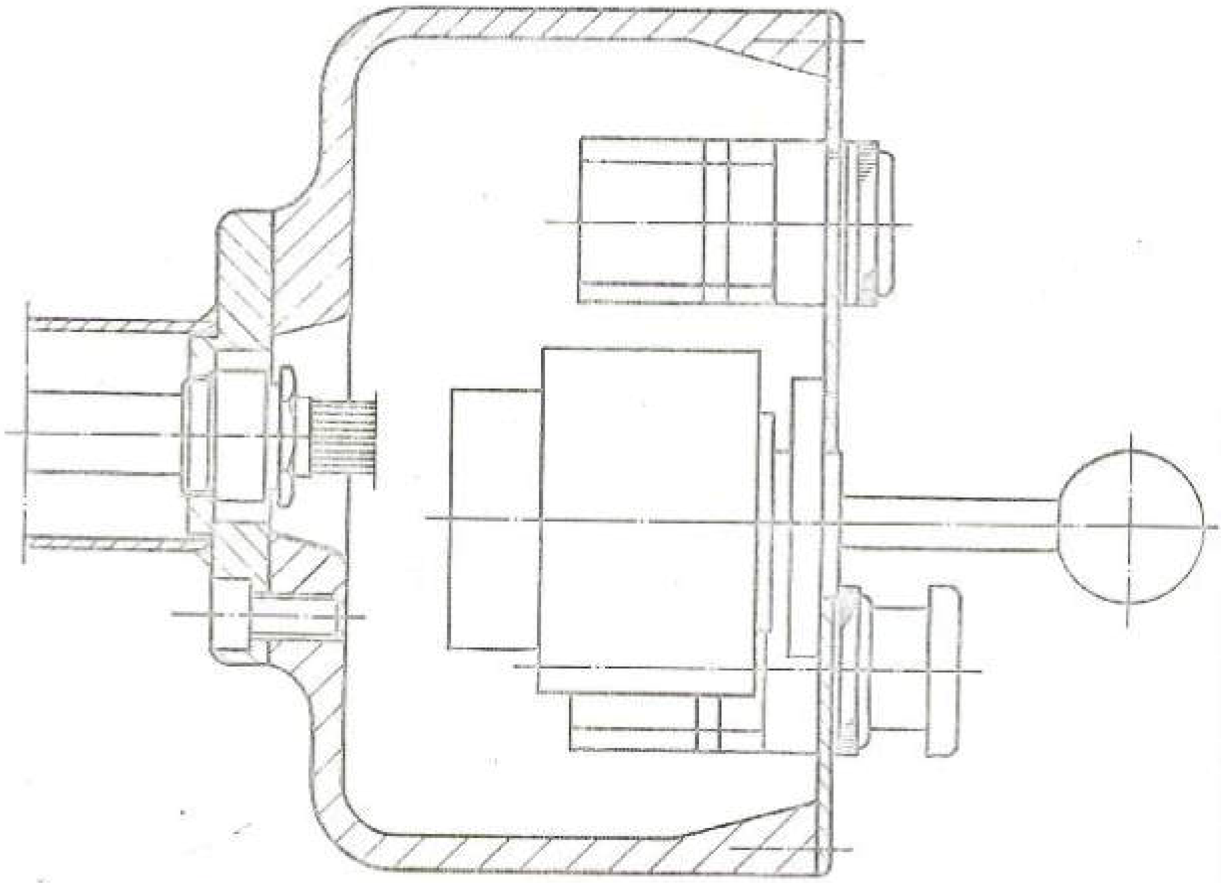
9. In order to discontinue certain feed movements automatically, each direction of travel is provided with suitable limit switches with adjustable and fixed cams. The fixed cams limit the maximum feed travel and must on no account be removed.

   For limit switch and cam positions, vide page 13 of these operating instructions.

Der Steuerpult

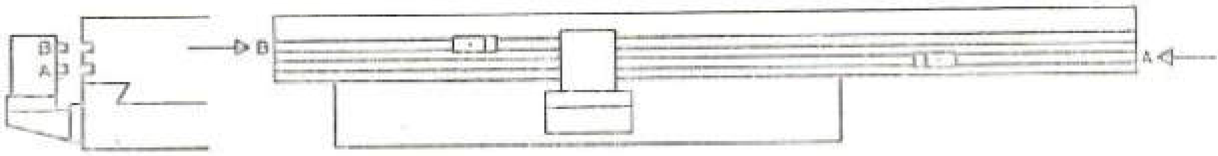
Control panel





Position of the mouvement limit switch
Anordnung der Wegeendschalter

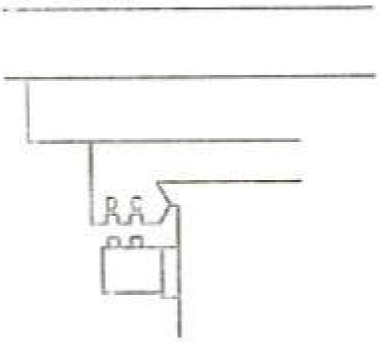
Achtung! Fest montierte Maximalwegunschläge dürfen auf keinen Fall entfernt werden.
Bewegliche Nocken können jederzeit nach gewünschter Fräslänge eingestellt werden.

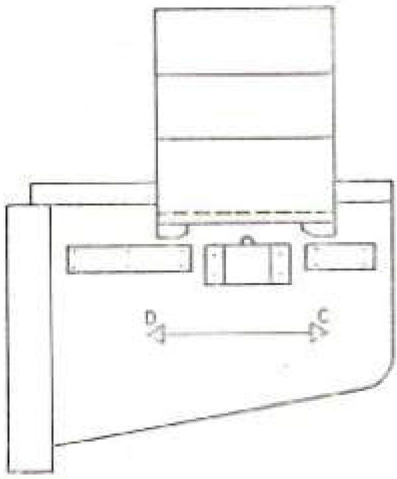


longitudenal mouvement
Längsbewegungen

Bahn A zu b3
Bahn B zu b3/1

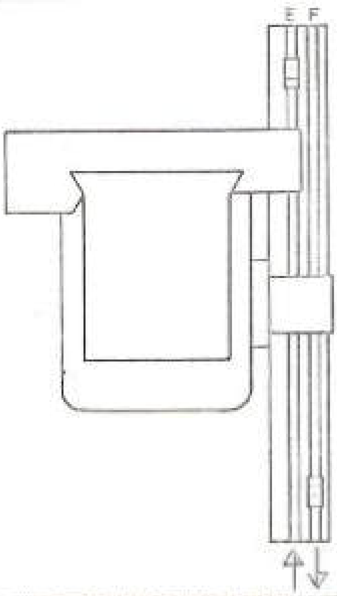
Nicht bei UF 7 vorhanden
no by UF 7





traverse mouvement
Querbewegungen

Bahn C zu b5
Bahn D zu b5/1



vertical mouvement
Senkrechtbewegungen

Bahn E zu b4
Bahn F zu b4/1

Setting of milling spindle speeds

Einstellungen der Frässpindeldrehzahlen

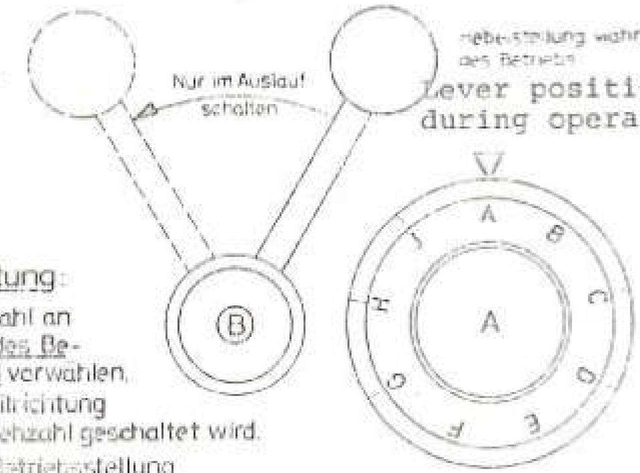
(Maschinen ohne sep. Vertikalkopfantrieb)

Machines w/o separate vertical head drive

UF 6 u. 7

Blatt 14

Shift in idle only



Lever position during operation

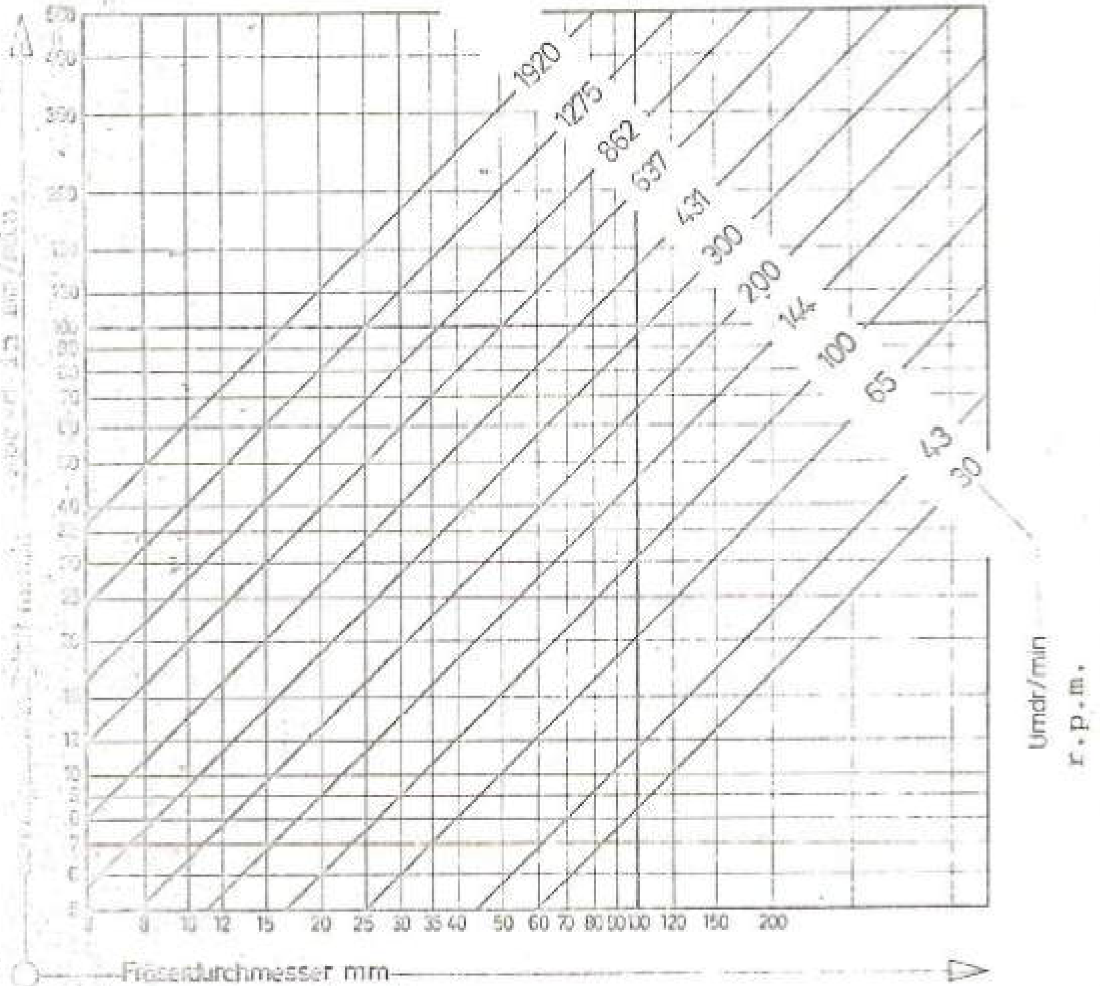
Zur besonderen Beachtung:

1. Gewünschte Spindeldrehzahl an Wählscheibe „A" während des Betriebes oder im Stillstand vorwählen.
2. Im Auslauf Hebel „B" in Pfeilrichtung umlegen, womit vorgew. Drehzahl geschaltet wird.
3. Hebel „B" gleich wieder in Betriebsstellung (siehe oben) zurücklegen. Maschine einschalten.

Note: 1. Set required spindle speed on selector disk A during operation or at stabdstill 2. In idle shift lever B in arrow direction therebyactuating the preselected speed. 3. Return lever B to operating position (see above) . Start Machine.

Drehzahldiagramm

Speed diagram



Milling cutter dia. in mm

Horizontal	
Vorwählscheibe	Umdr./min
Motorstufe I	
A	30
B	43
C	65
D	100
E	144
F	212
G	302
H	431
J	637
Motorstufe II	
A	61
B	87
C	129
D	200
E	280
F	424
G	604
H	862
J	1275

Vertikal	
Vorwählscheibe	Umdr./min
Motorstufe I	
A	66
B	98
C	142
D	224
E	322
F	452
G	674
H	960
J	1420
Motorstufe II	
A	132
B	196
C	284
D	448
E	644
F	904
G	1348
H	1920
J	2840

Adjusting of the table feeds

Einstellungen der Tischvorschübe

UF7; VF7

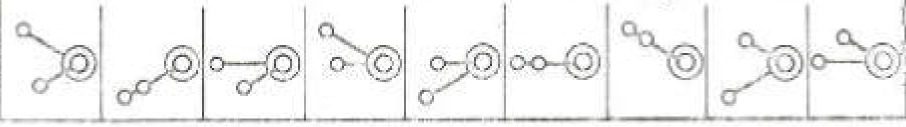
Blatt: 15

Vorschubschaltgetriebe im Lauf, jedoch nicht unter Last schaltbar
Feed - gearbox can be shifted while rotating, but not under load

Settings / Einstellungen — Vorschübe in mm pro Minute / Feeds in mm/min. — Eilgänge in mm/Min. / Rapid movements in mm/min.

Feed-Motor / Vorschub Motor: I = n 1400, II = n 2800

Bewegungen / Movements — Hebelstellungen / Lever positions



Worm gear ratio in feed gear-box i= 15.33
Schneckenübersetzung im Vorschubgetriebe i= 15.33

Bewegungen / Movements	Feed-Motor										Eilgänge / Rapid movements in mm/min
Longitudenal LÄNGS	I	8.0	10.8	16.8	23.6	32.0	50.0	69.0	93.0	146.0	742
	II	16.0	21.6	33.6	47.2	64.0	100.0	138.0	186.0	292.0	
Vertical VERTIKAL	I	1.6	2.16	3.36	4.72	6.40	10	13.8	18.6	29.2	168.4
	II	3.2	4.32	6.72	9.44	12.80	20	27.6	37.2	58.4	

i= 11.25

Bewegungen / Movements	Feed-Motor										Eilgänge / Rapid movements in mm/min
Longitudenal LÄNGS	I	10.4	14.0	22.0	30.8	42.0	65.3	90.0	122.0	190.0	1000
	II	20.8	28.0	44.0	61.6	84.0	130.6	180.0	244.0	380.0	
Vertical VERTIKAL	I	2.08	2.80	4.40	6.16	8.4	13.06	18.0	24.4	38.0	200
	II	4.16	5.60	8.80	12.32	16.8	26.12	36.0	48.8	76.0	

i = 8.60 (Standardausrüstung)
(Standard equipment)

Bewegungen / Movements	Feed-Motor										Eilgänge / Rapid movements in mm/min
Longitudenal LÄNGS	I	14.4	19.4	30.0	42.5	56.0	90.0	122.0	168.0	266.0	1300
	II	28.8	38.8	60.0	85.0	112.0	180.0	244.0	336.0	532.0	
vertical VERTIKAL	I	2.88	3.88	6.00	8.50	11.20	18.0	24.4	33.6	53.2	260
	II	5.76	7.76	12.00	17.00	22.40	36.0	48.8	67.2	106.4	

i = 6.83

Bewegungen / Movements	Feed-Motor										Eilgänge / Rapid movements in mm/min
Longitudenal LÄNGS	I	18.0	24.45	38.0	53.2	73.0	113.5	156.0	212.0	332.0	1640
	II	36.0	48.9	76.0	106.4	146.0	227.0	312.0	424.0	664.0	
vertical VERTIKAL	I	3.60	4.89	7.60	10.64	14.6	22.7	31.2	42.4	66.40	328
	II	7.20	9.78	15.20	21.28	29.2	45.4	62.4	84.8	132.80	

i = 5.57 Getriebe mit dieser Übersetzung nur im Auslauf schalten
Gearbox with this ratio to be shifted only as speed

Bewegungen / Movements	Feed-Motor										Eilgänge / Rapid movements in mm/min
Longitudenal LÄNGS	I	22.0	29.6	46.0	65.4	90.0	138.0	190.0	256.0	400.0	2015
	II	44.0	59.2	92.0	130.8	180.0	276.0	380.0	512.0	800.0	
vertical VERTIKAL	I	4.40	5.90	9.20	13.0	18.0	27.6	38.0	51.2	80.0	403
	II	8.80	11.80	18.40	26.0	36.0	55.2	76.0	102.4	160.0	

Richtwerte für Fräsgeschwindigkeiten I

UF 5.6.7.8
VF 5.6.7
Blatt: 16

Schnittgeschwindigkeit v in m/min Vorschubgeschwindigkeit s' in mm/min

Fräserart und zu zerspanender Werkstoff	Schlichten bis Frästiefe 1 mm		Schruppen bis Frästiefe 5 mm	
Walzenfräser DIN 884 Fräsbreite bis 100 mm	v	s'	v	s'
Stahl 90...100 kg/mm² Festigkeit	10...14	35...45	10...12	45...70
Stahl 70...80 kg/mm² Festigkeit	14...18	40...60	12...14	70...100
Stahl 50...70 kg/mm² Festigkeit	18...22	50...80	15...18	90...150
Gußeisen bis 200 Brinellhärte	14...18	70...90	12...14	100...170
Leichtmetall	200...300	100...150	150...250	150...280
Messing	40...60	100...160	30...40	150...220
Schaftfräser DIN 844/845 Fräsbreite bis 60 mm	v	s'	v	s'
Stahl 90...100 kg/mm² Festigkeit	16...18	40...50	12...14	15...25
Stahl 70...80 kg/mm² Festigkeit	18...20	55...75	14...16	25...40
Stahl 50...70 kg/mm² Festigkeit	20...24	75...90	16...18	35...55
Gußeisen bis 200 Brinellhärte	18...20	80...100	14...16	40...75
Leichtmetall	150...180	70...100	140...180	50...90
Messing	50...60	100...135	30...40	60...100
Walzenstirnfräser DIN 841 u. 883 Fräsbreite bis 100 mm	v	s'	v	s'
Stahl 90...100 kg/mm² Festigkeit	12...14	30...40	10...12	40...60
Stahl 70...80 kg/mm² Festigkeit	16...18	40...60	12...14	70...90
Stahl 50...70 kg/mm² Festigkeit	20...22	50...75	16...18	90...120
Gußeisen bis 200 Brinellhärte	16...18	70...90	12...15	100...150
Leichtmetall	200...300	90...135	150...220	140...280
Messing	40...60	80...155	30...40	150...250
Kunststoffe*	25...30	40...70	15...22	60...80
Kunststoffe (Fräser m. Hartm. Schneid.)	30...40	40...70	25...35	60...80

Richtwerte für die zul. Spanmenge in cm³/kw min

Werkoffe	Zulässige Spanmenge
Legierte Stähle (vergütet)	8...10 cm³/KW min
Legierte Stähle (geglüht)	10...12 cm³/kw min
Unlegierte Stähle	12...15 cm³/kw min
Gußeisen (mittelhart)	20...26 cm³/kw min
Messing und Rotguß	30...40 cm³/kw min
Leichtmetalle	40...60 cm³/kw min

Richtwerte für Fräsgeschwindigkeiten II

UF5,6,7,8
VF5,6,7
Blatt: 17

Schnittgeschwindigkeit v in m/min		Vorschubgeschwindigkeit s' in mm/min			
Fräserart (HSS) u.z. zersp. Werkstoff		Schlichten bis a 1mm		Schruppen bis a 5mm	
Messerkopf DIN 1830 Fräsbr. ÷ 130mm		v	s'	v	s'
STAHL:	90 ... 100	15 ... 20	30 ... 60	16 ... 18	60 ... 75
Festigkeit kg/mm²	70 ... 80	20 ... 25	40 ... 70	20 ... 25	70 .. 100
	50 ... 70	25 ... 30	40 ... 80	18 ... 22	90 .. 120
GUSSEISEN Brinellhärte HB bis 200 (Werkzeuge mit Hartmetall)		60 ... 80	100 .. 150	60 ... 70	100 .. 150
LEICHTMETALL		200 .. 400	80 .. 150	200 .. 300	150 .. 200
MESSING		50 ... 80	90 .. 150	40 ... 60	100 .. 200
Scheibenfräser DIN 885 Fräsbreite ÷ 20 mm		Fertigfräsen bis a 40 mm		Vorschruppen bis a 10 mm	
		v	s'	v	s'
STAHL:	90 ... 100	10 ... 14	10 ... 20	10 ... 12	40 ... 60
Festigkeit kg/mm²	70 ... 80	14 ... 18	15 ... 25	12 ... 14	70 ... 90
	50 ... 70	18 ... 22	20 ... 45	16 ... 18	90 .. 120
GUSSEISEN Brinellhärte HB bis 200 (Werkzeuge mit Hartmetall)		14 ... 18	25 ... 50	12 ... 14	100 ... 150
LEICHTMETALL		200 ... 300	60 .. 120	150 .. 250	150 .. 300
MESSING		40 ... 60	40 ... 75	30 ... 40	140 .. 200
Metallkreissägen DIN 1838 Schnittbreite ÷ 3mm		Schnittiefe bis a 4 mm		Schnittiefe bis a 8mm	
		v	s'	v	s'
STAHL:	90 ... 100	25 ... 30	30 ... 40	20 ... 25	20 ... 30
Festigkeit kg/mm²	70 ... 80	35 ... 40	45 ... 60	30 ... 35	35 ... 50
	50 ... 70	45 ... 50	60 ... 75	40 ... 45	45 ... 60
GUSSEISEN Brinellhärte HB bis 200		30 ... 40	60 ... 80	30 ... 35	45 ... 60
LEICHTMETALL		300 .. 400	200 .. 300	300 .. 350	150 .. 200
MESSING		300 .. 400	200 .. 300	300 .. 400	150 .. 200
KUNSTSTOFFE		200 .. 300	150 .. 200	150 .. 200	80 .. 100

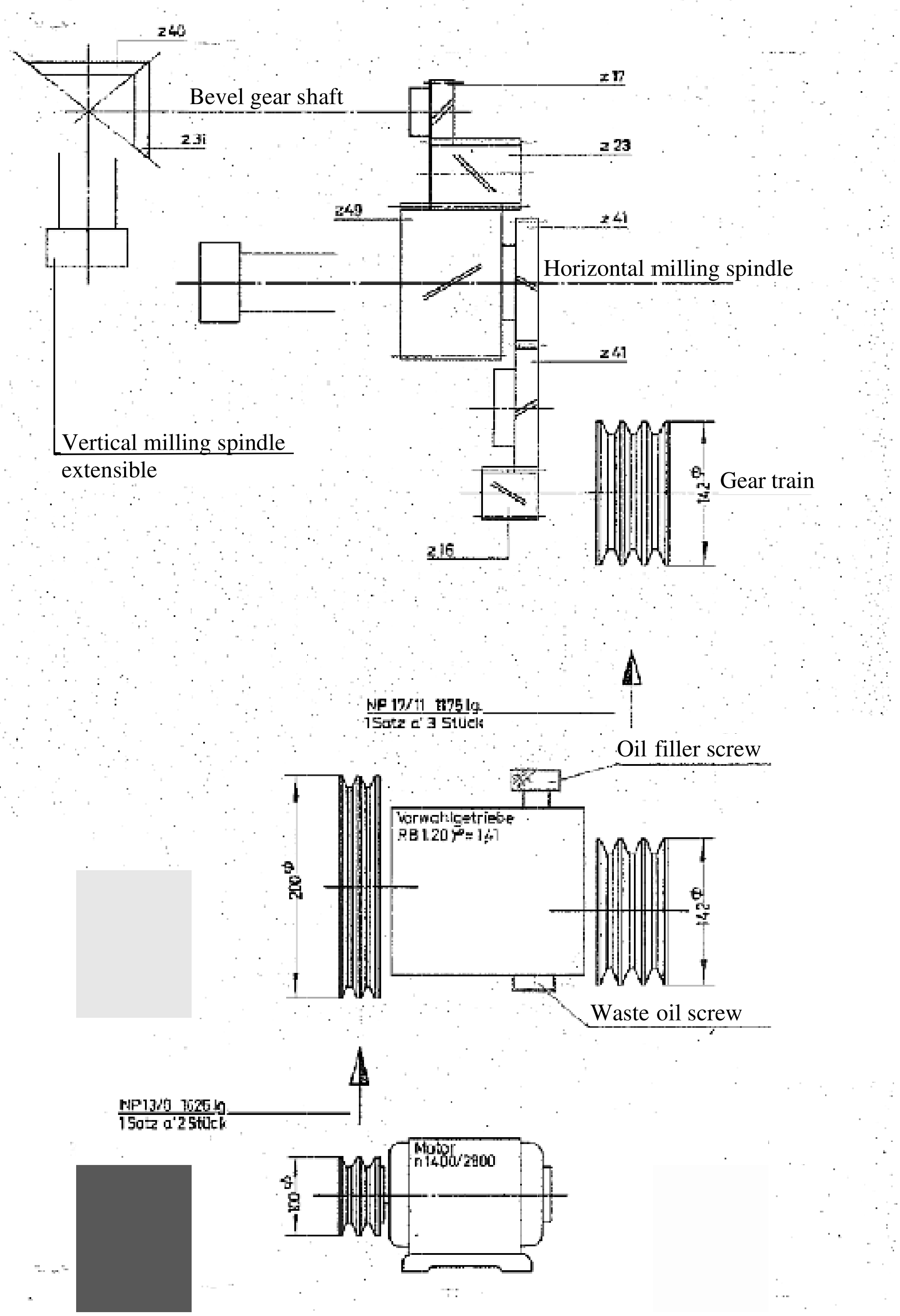
Richtwerte für Vorschübe in mm/Fräserzahn
(FRÄSER HSS)

a = Frästiefe

		Walzenfräser			Stirnfräser			Scheibenfräser	
		Schruppen		Schlichten	Schruppen		Schlichten	Schruppen	Schlichten
		a ÷ 8mm	a ÷ 5mm	a ÷ 1mm	a ÷ 8 mm	a ÷ 5 mm	a ÷ 1mm	–	a ÷ 1mm
STAHL:	bis . 60	0,22	0,26	0,10	0,25	0,30	0,12	0,08	[illegible]
Festigkeit kg/mm²	60 ... 90	0,20	0,24	0,08	0,22	0,27	0,10	0,07	[illegible]
	90 ... 110	0,17	0,22	0,06	0,20	0,24	0,08	0,05	0,03
	über 110	0,10	0,12	0,04	0,12	0,14	0,06	0,03	0,03
GUSSEISEN:	bis 180	0,22	0,30	0,08	0,25	0,34	0,10	0,08	0,05
Härte Brinell (HB)	über 180	0,18	0,20	0,06	0,18	0,20	0,08	0,06	0,04
MESSING		0,24	0,28	0,10	0,25	0,30	0,10	0,08	0,05
LEICHTMETALL	-	0,10	0,12	0,04	0,12	0,16	0,06	0,10	0,08
KUPFER		0,26	0,30	0,08	0,26	0,30	0,10	0,10	0,06

Schematic presentation of the main drive

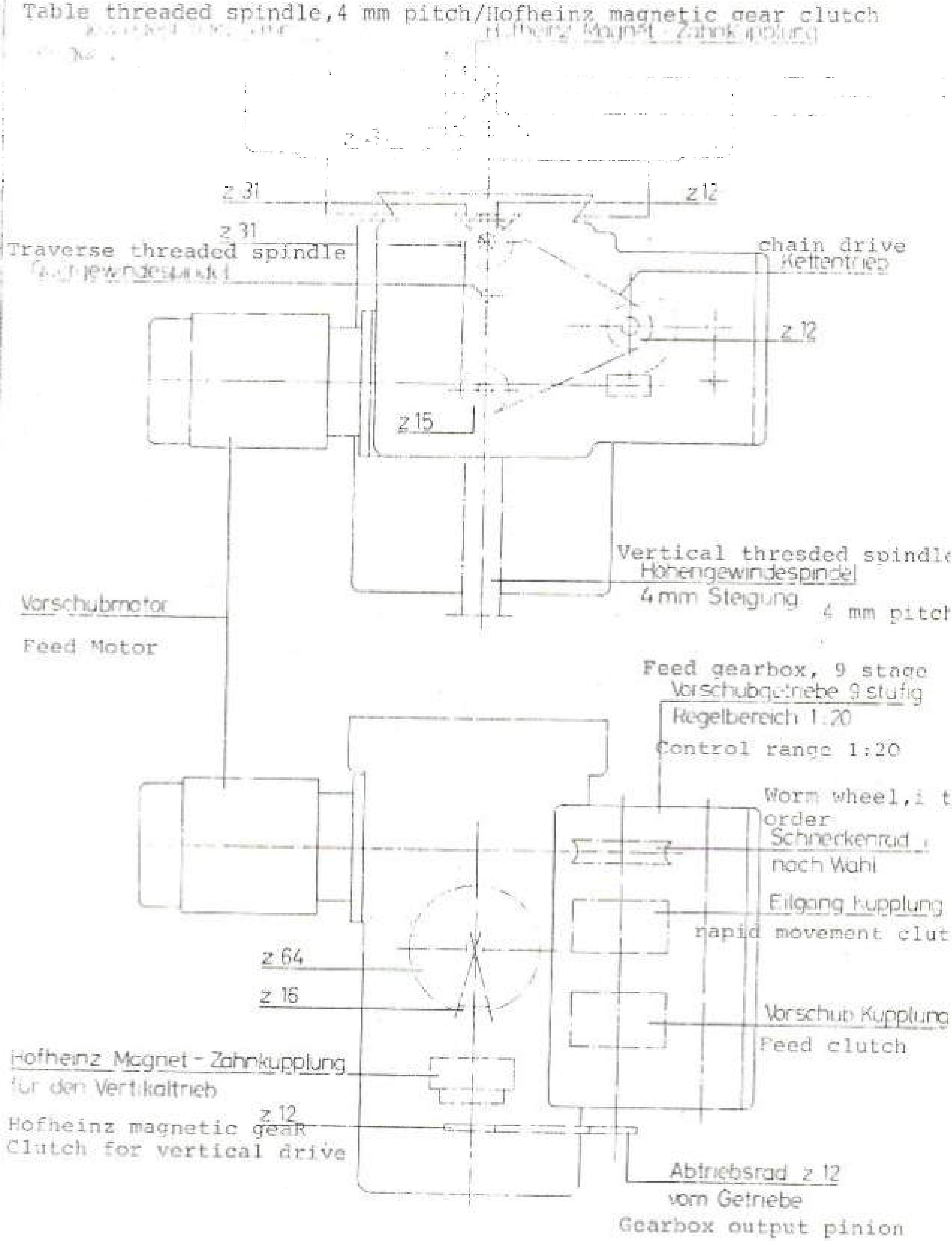
UF 7
Blatt: 18



Schema des Vorschubantriebes

Feed drive schematic

UF 7; VF
Blatt 19



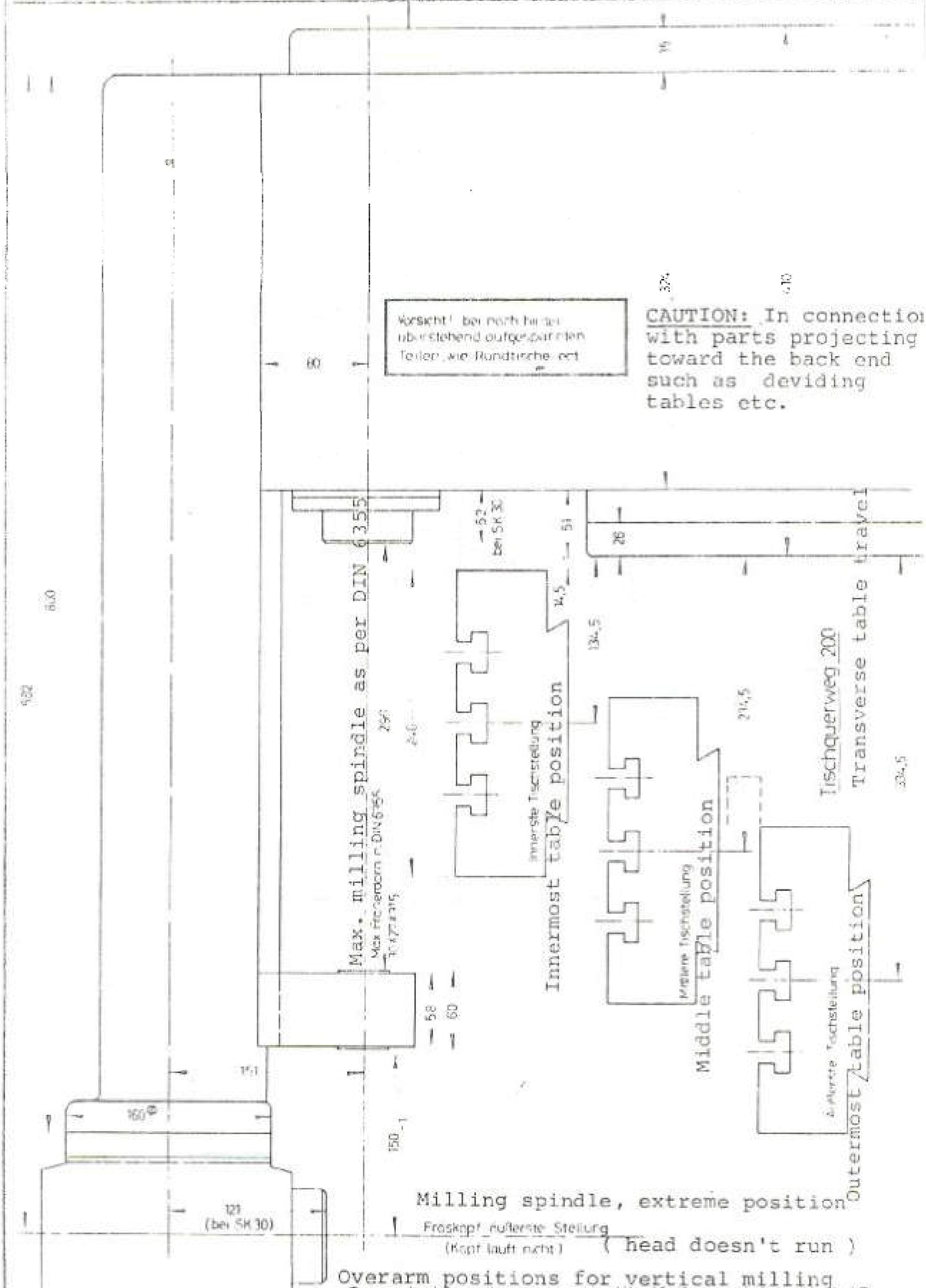
z= Nr. of teeth

Schema der Querbewegung des Frästisches

Schematic presentation of transverse table travel

UF6 N, UF7

Blatt 20



Overarm positions for vertical milling

Gegenhalterstellungen z. Vertikalfräsen siehe Blatt 47

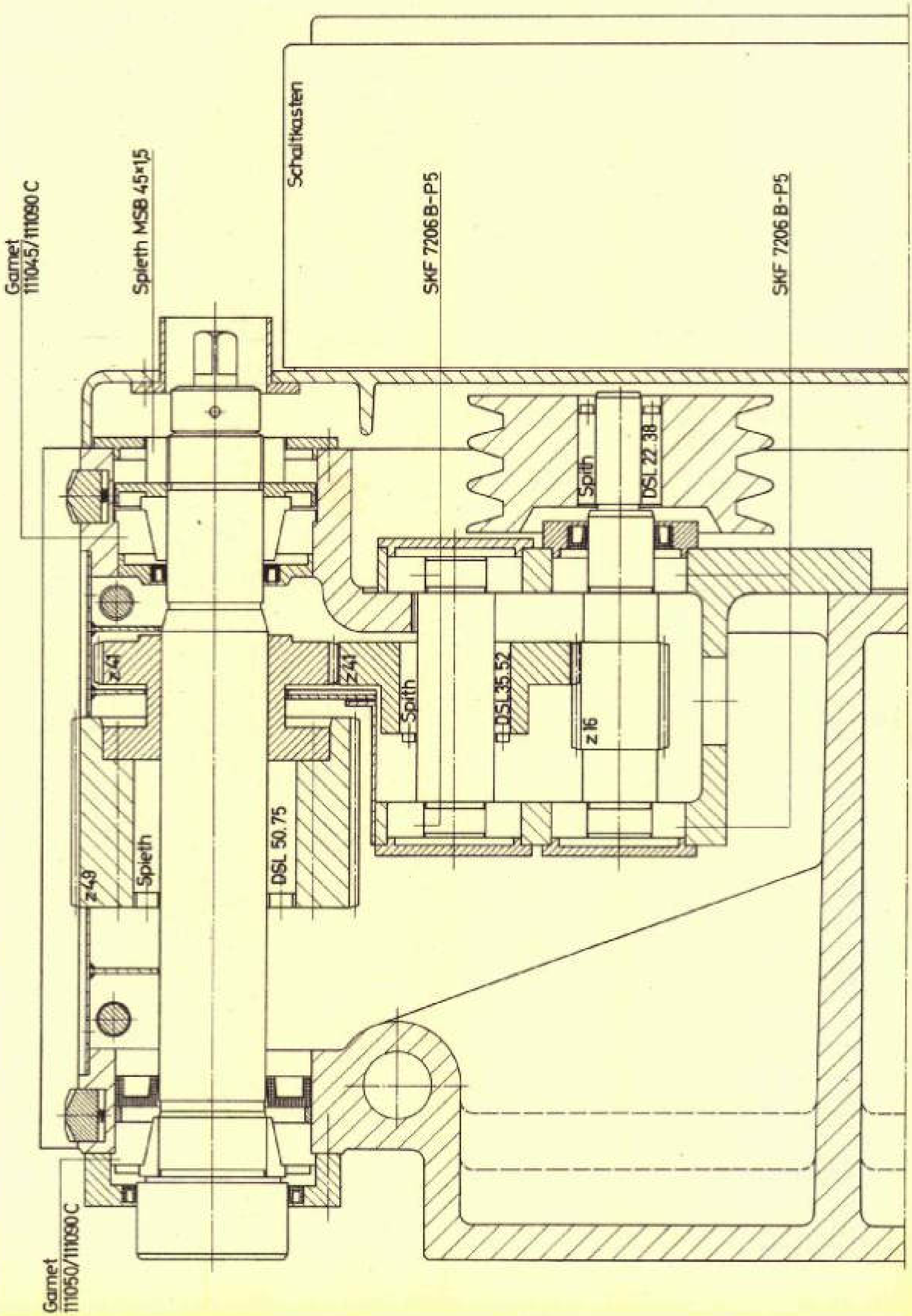
vide page

Horizontalfrässpindel mit Antrieb

Horizontal milling spindle and drive

UF6,7

Blatt: 21



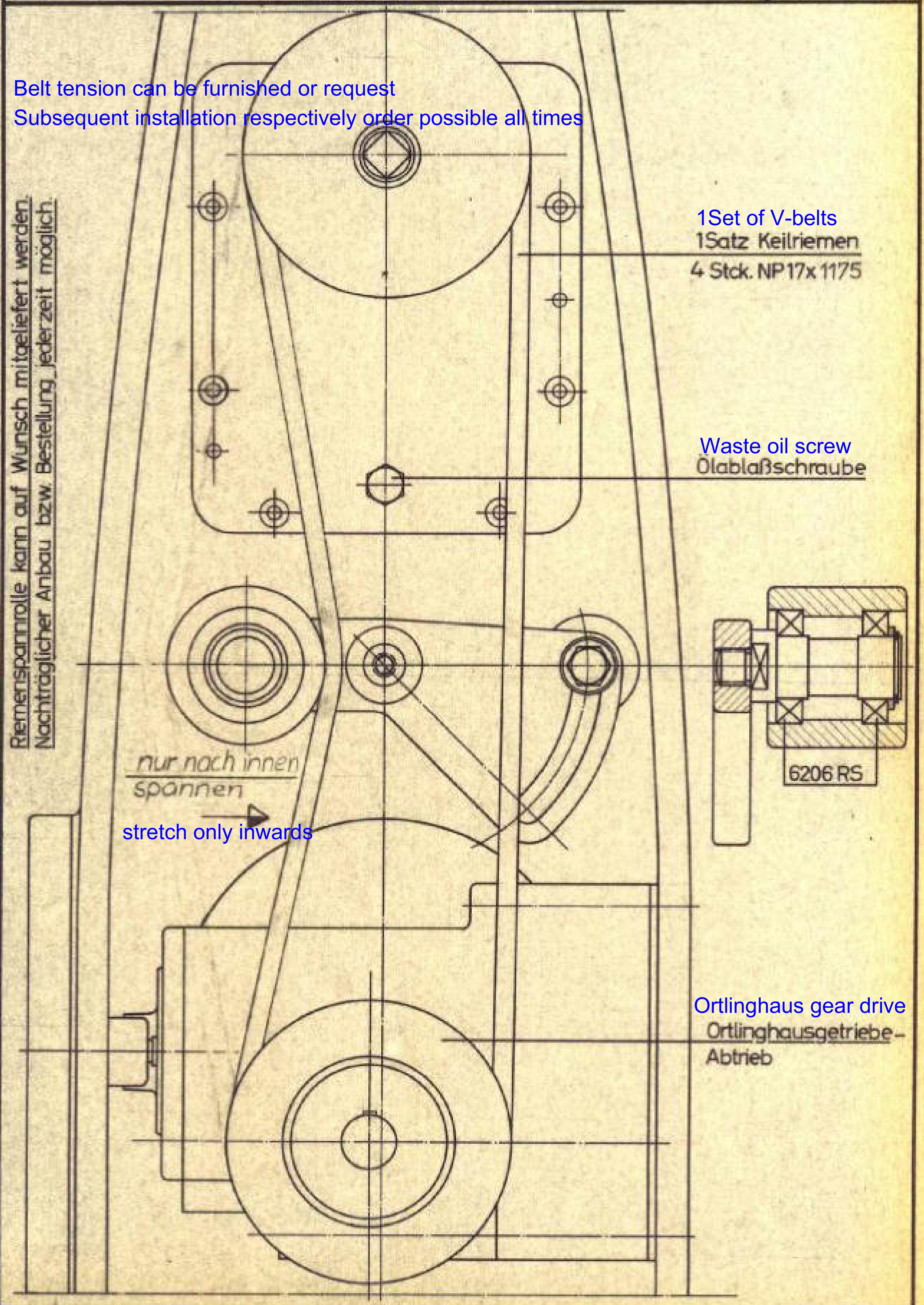
Erwin Rudolf Kunzmann Pforzheim–Nöttingen

V-belt tension of the main drive

Keilriemenspannung

des Haupantriebes

UF6; UF7
VF6; VF7
Blatt: 22



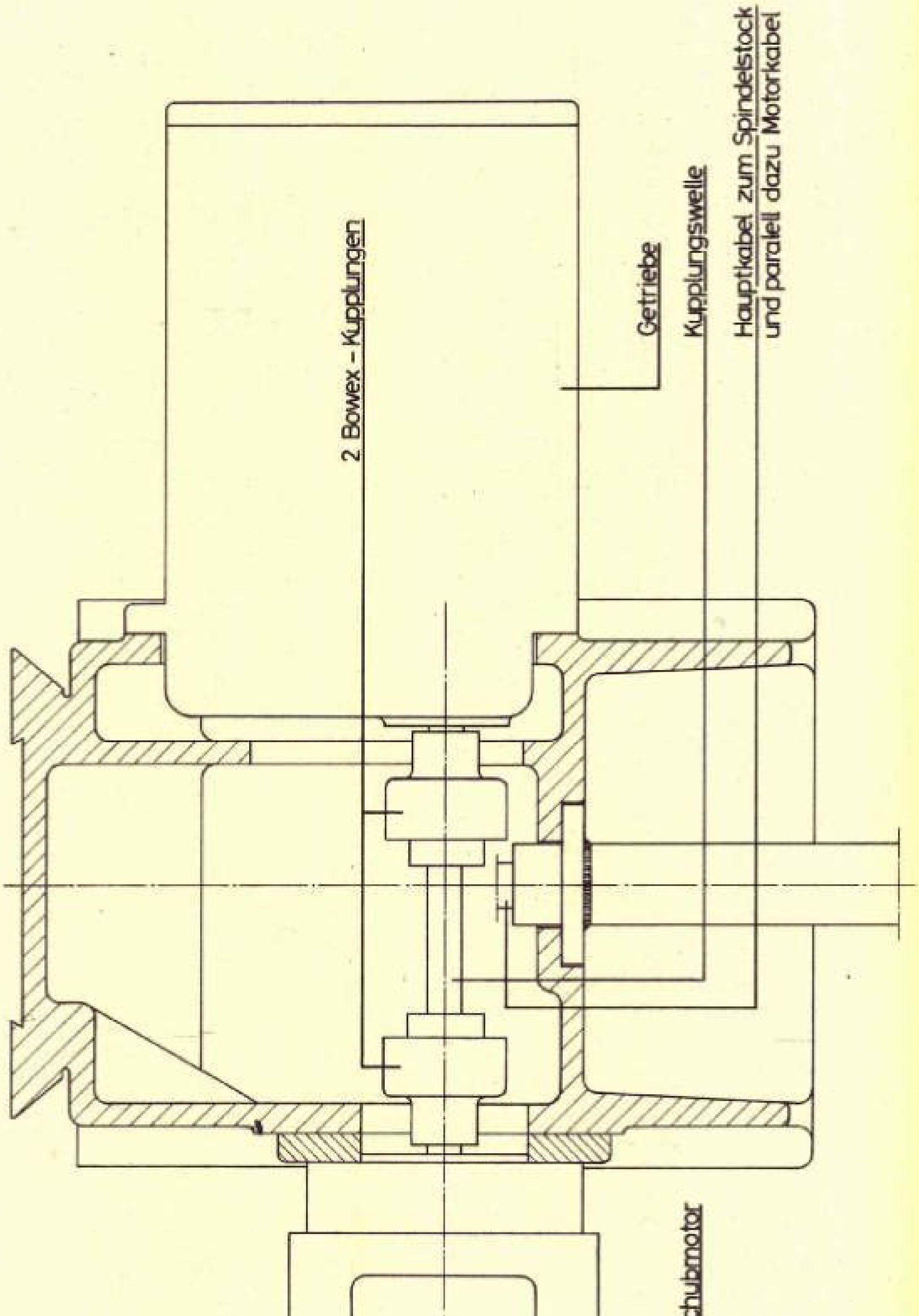
Erwin Rudolf Kunzmann Pforzheim-Nöttingen

Antrieb des Vorschubgetriebes

UF 7

Blatt:23

Feed gearbox drive



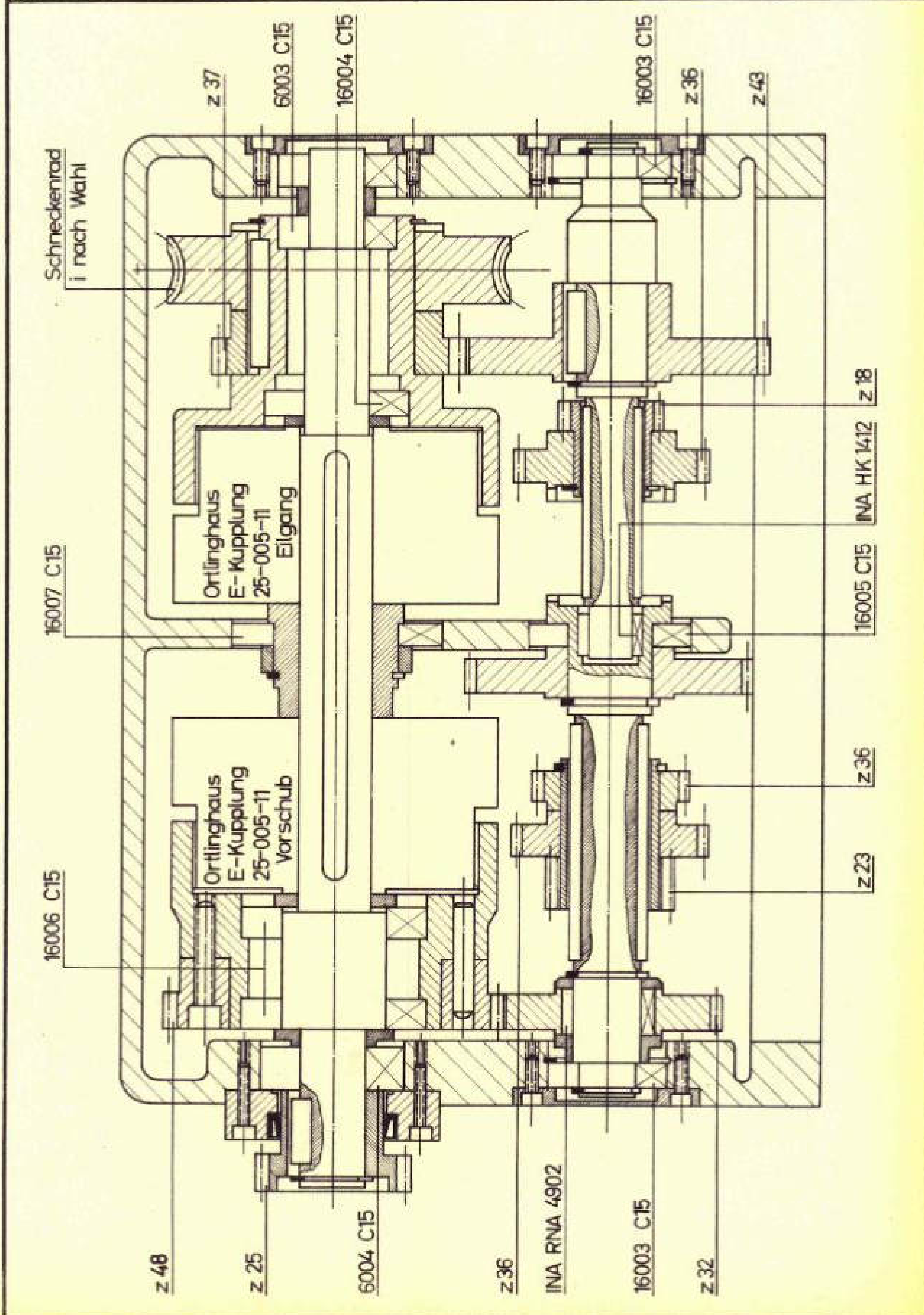
Erwin Rudolf Kunzmann Pforzheim-Nöttingen

Vorschubgetriebe im Längsschnitt I

UF 7 u. 8

Blatt: 24

Feed gearbox, longitudinal section I



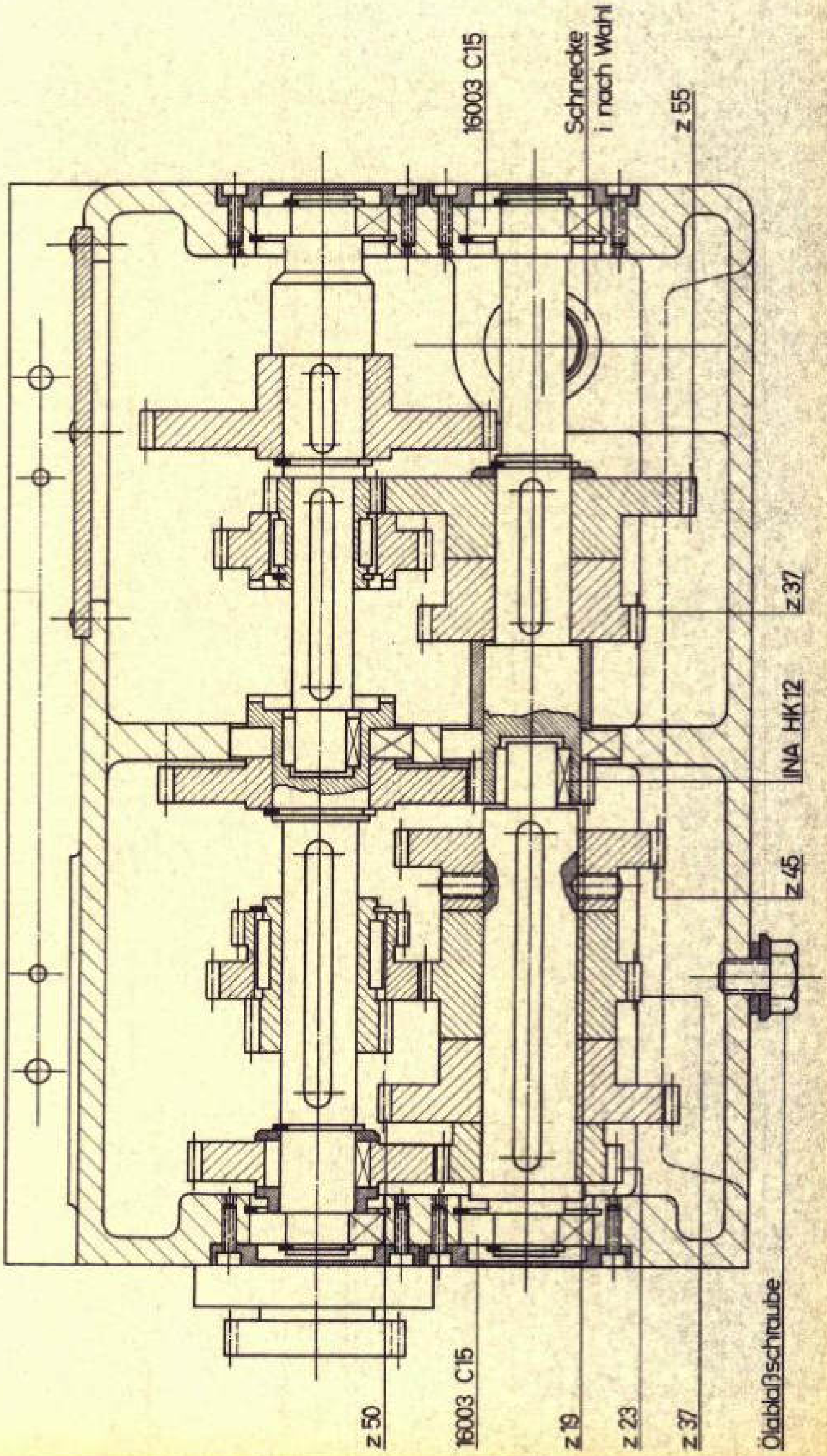
Erwin Rudolf Kunzmann Pforzheim-Nöttingen

Vorschubgetriebe im Längsschnitt II

Feed gearbox, longitudinal section II

UF 7u.8

Blatt:25



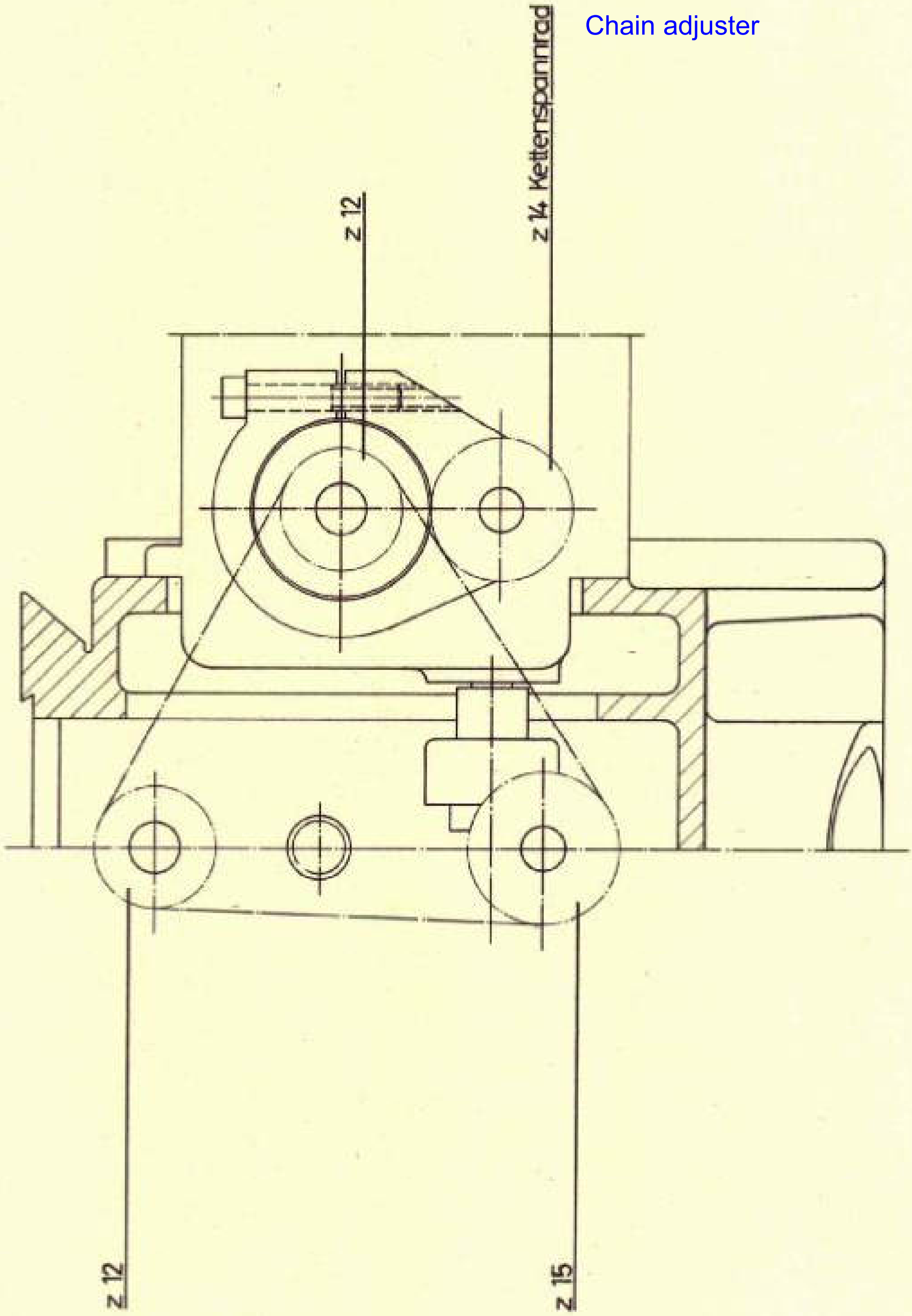
Erwin Rudolf Kunzmann Pforzheim-Nöttingen

Abtrieb vom Vorschubgetribe

Feed gearbox output

UF 7

Blatt:26



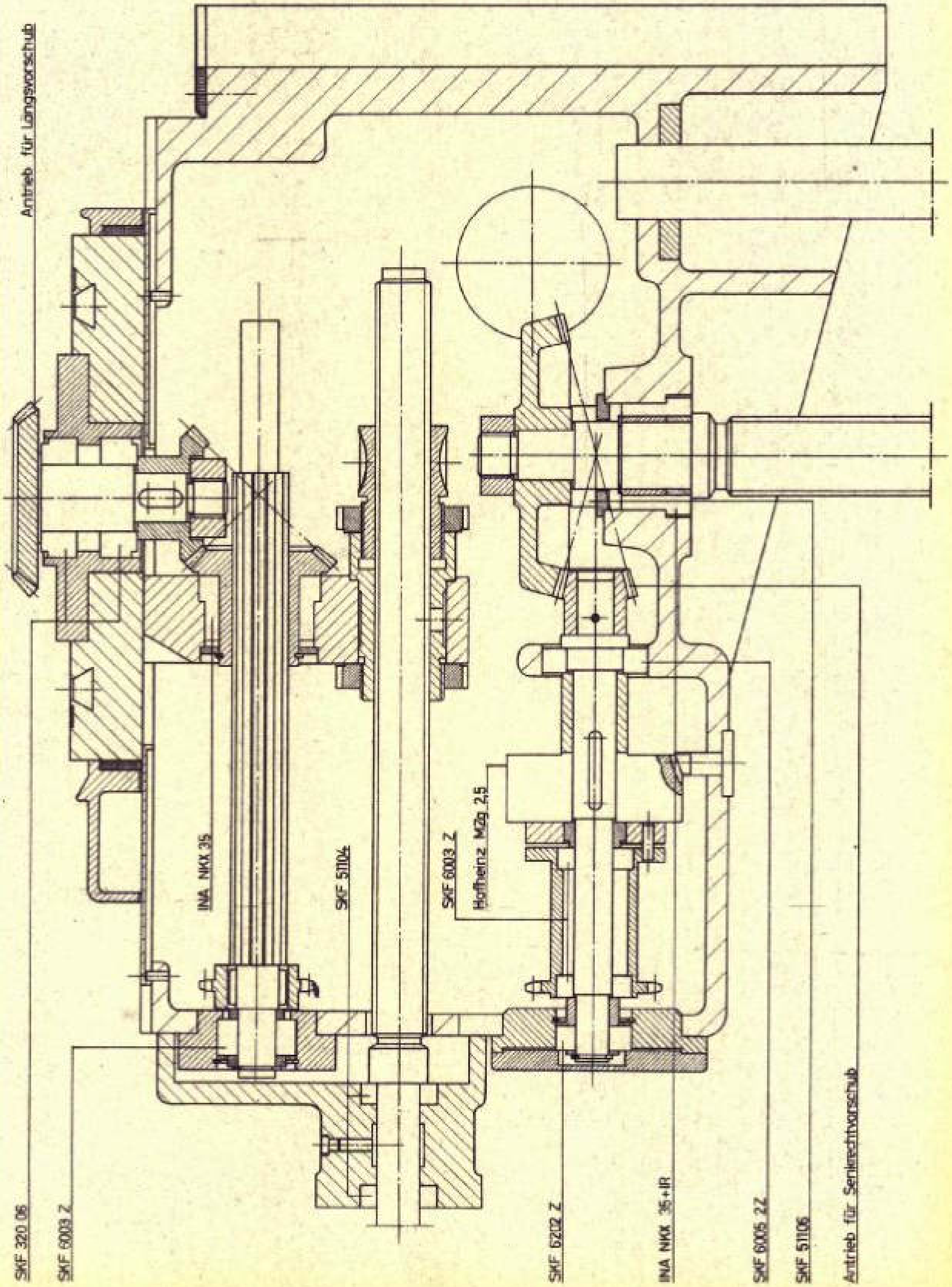
Erwin Rudolf Kunzmann Pforzheim-Nöttingen

Vertikaler Längsschnitt Winkelkonsole

Vertical longitudinal section angle drive unit

UF 7

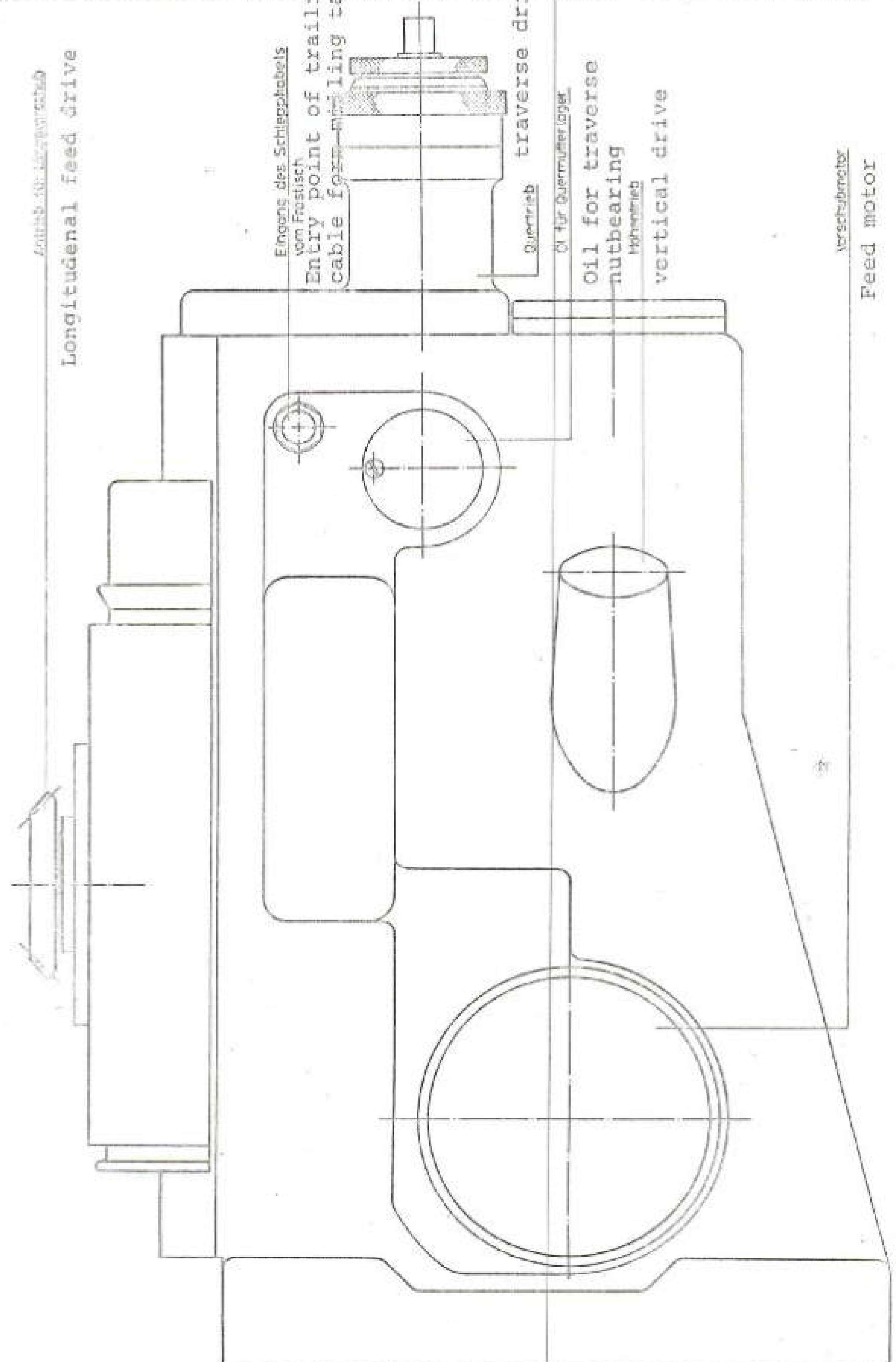
Blatt: 27



Erwin Rudolf Kunzmann Pforzheim-Nöttingen

The angle bracket on the drive side

Die Winkelkonsole auf der Antriebsseite

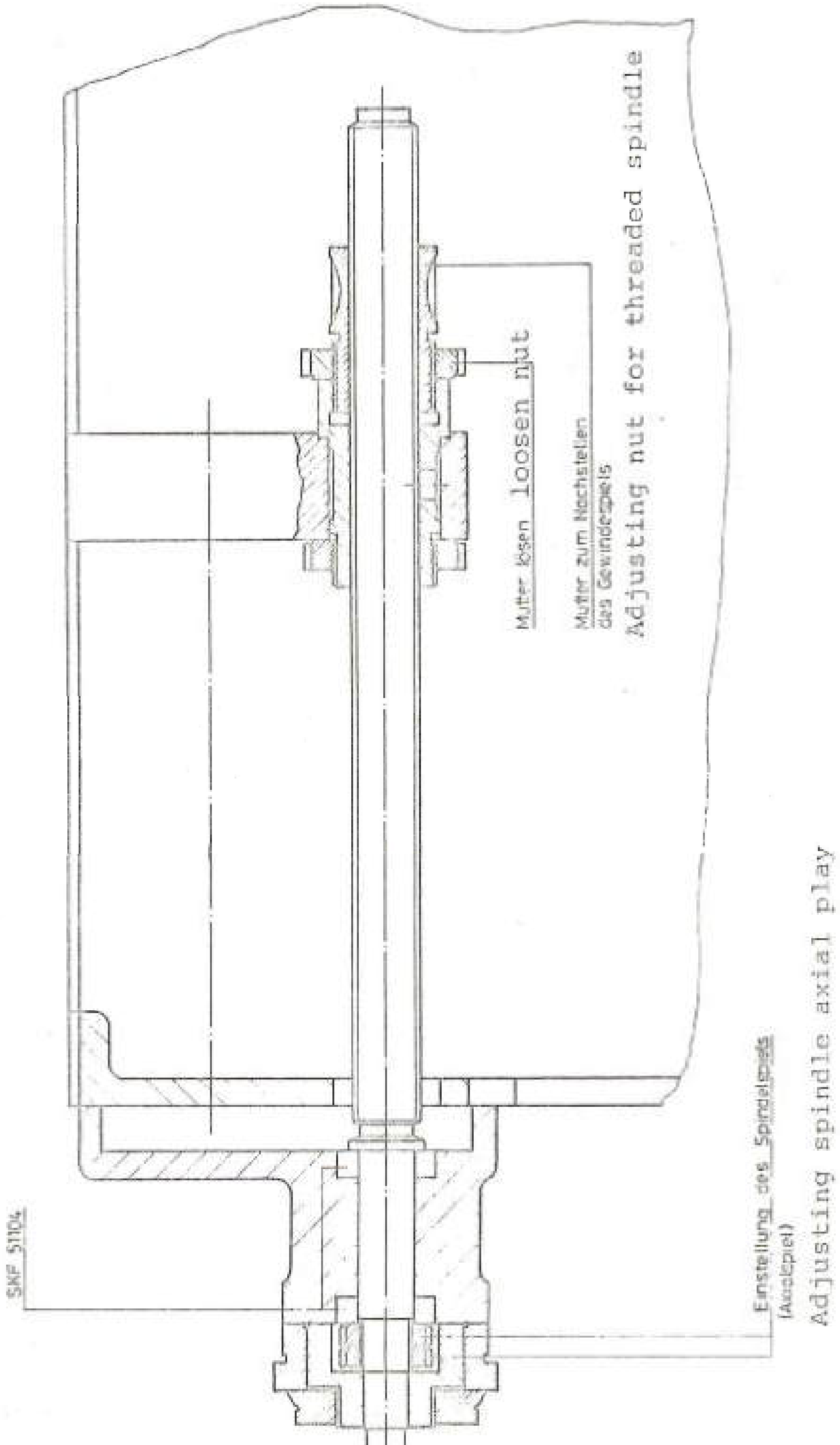


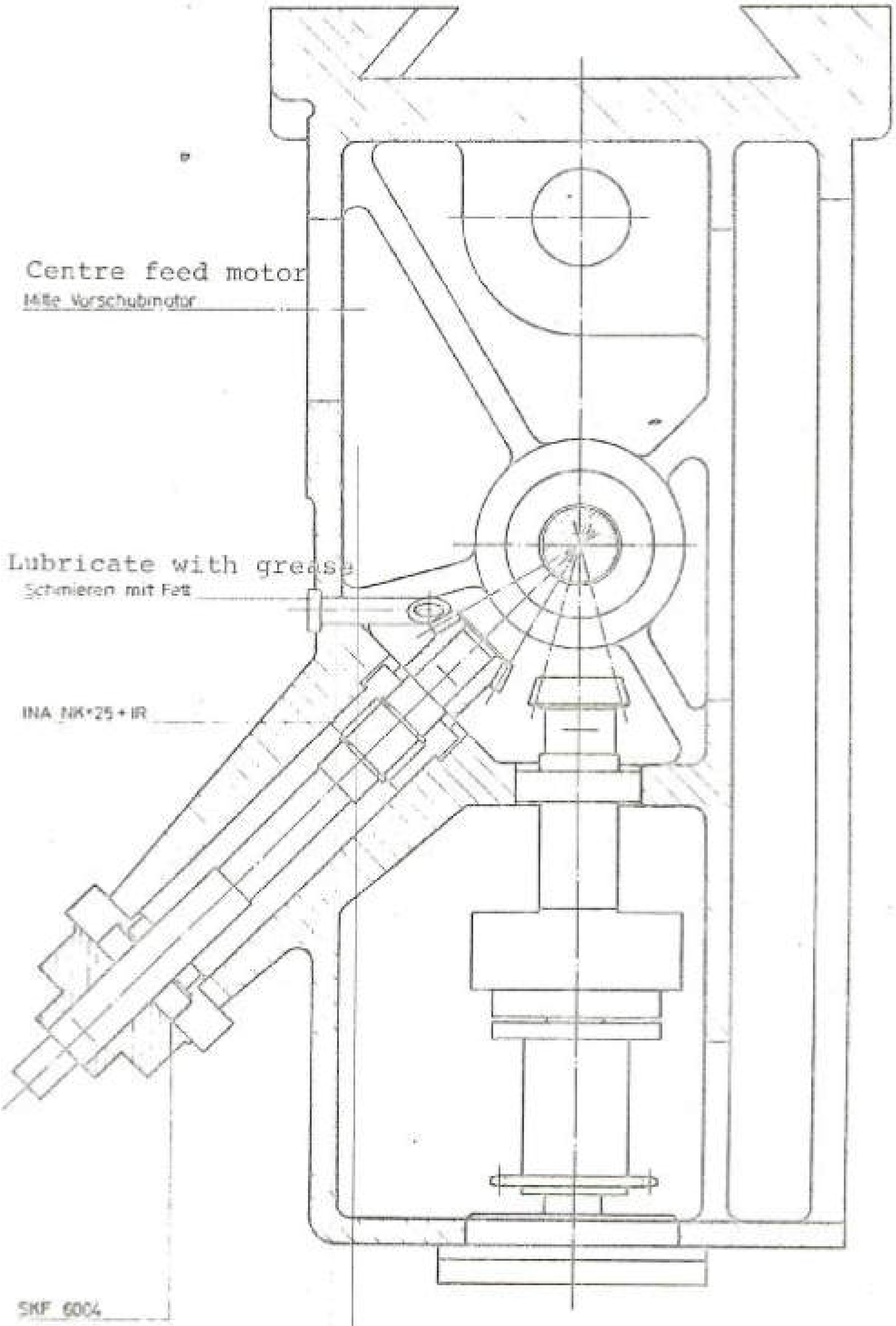
Adjusting traverse threaded spindle play

Einstellung des Quergewindespindelspiels

UF 7; VF 7

Blatt: 29

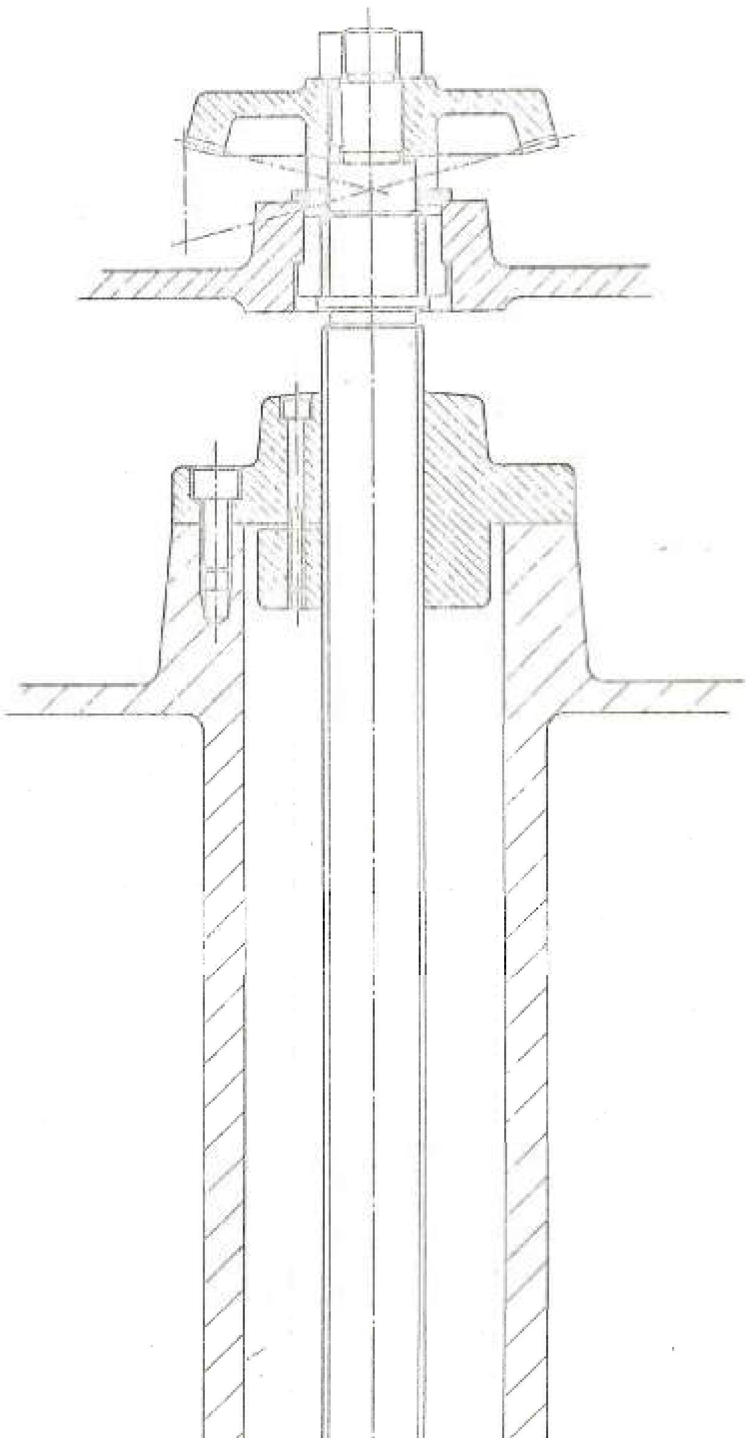



Centre feed motor
Mitte Vorschubmotor
Lubricate with grease
Schmieren mit Fett
INA NK*25 + IR
SKF 6004

Open vertical adjustment spindle

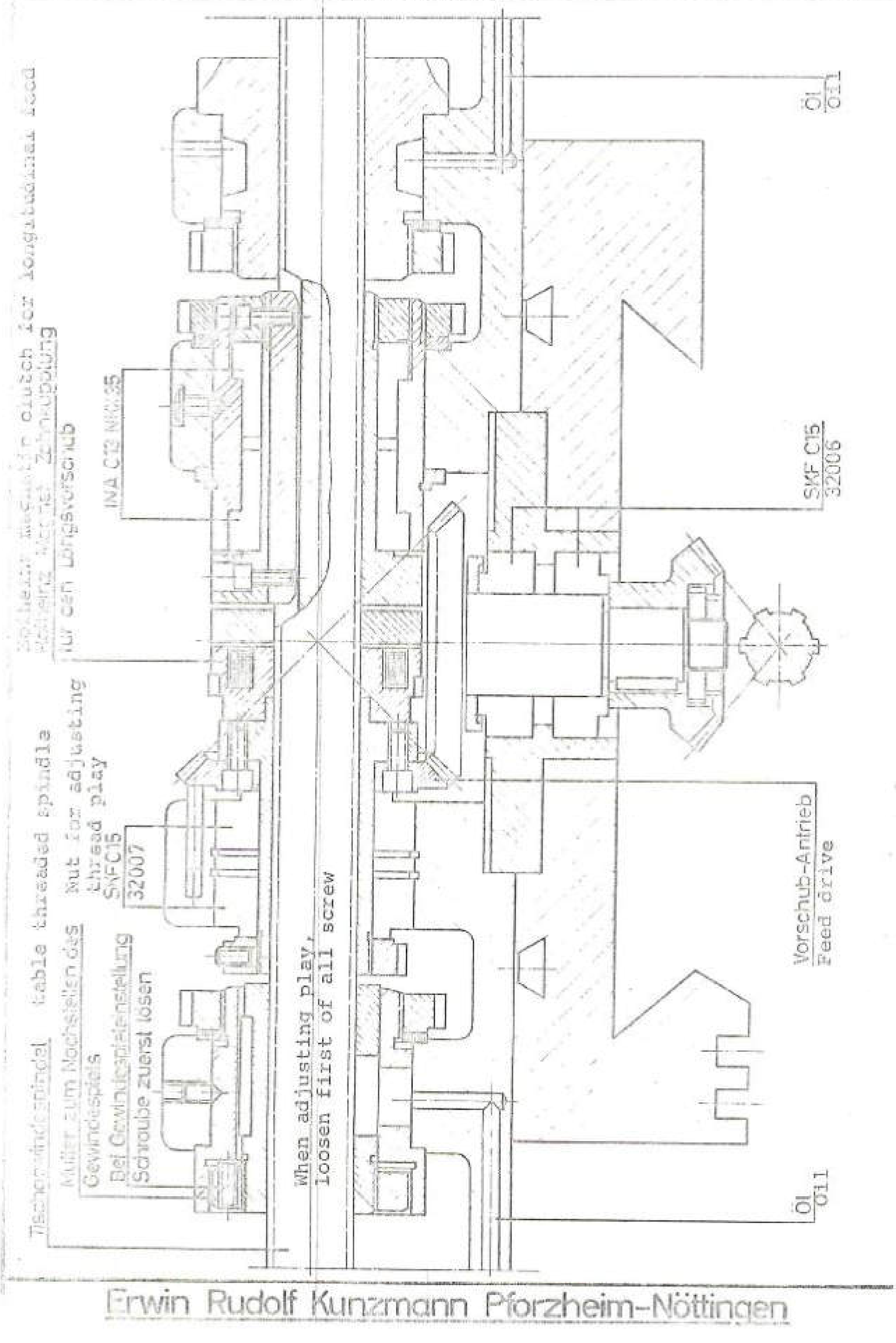
Die offene Höhengewindespindel

HF-6, VF-5,6,7
UF 5,6,7,8
Blatt: 31.2



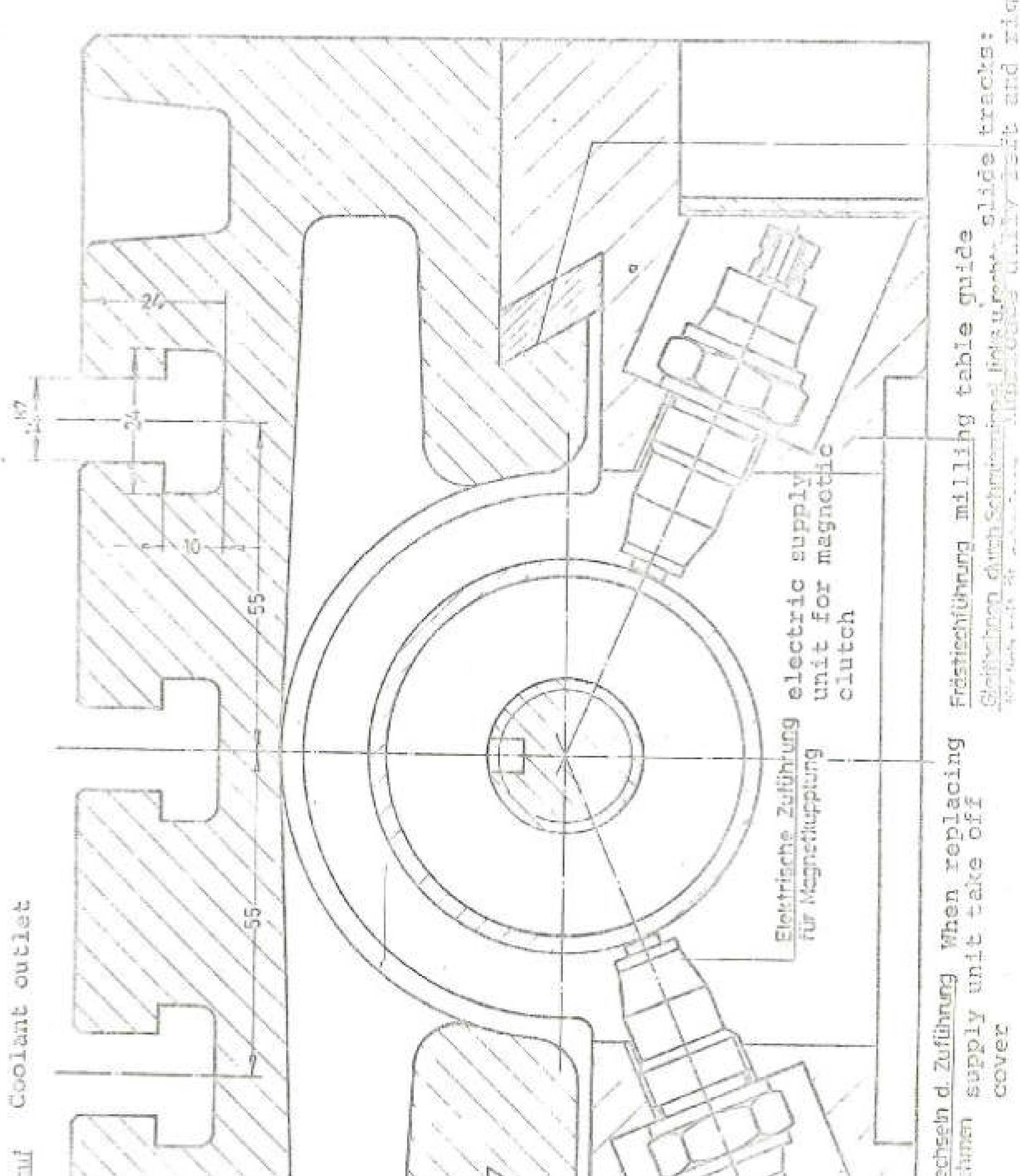
Längsschnitt u. Antrieb Fröstisch

Longitudinal section and drive, milling table

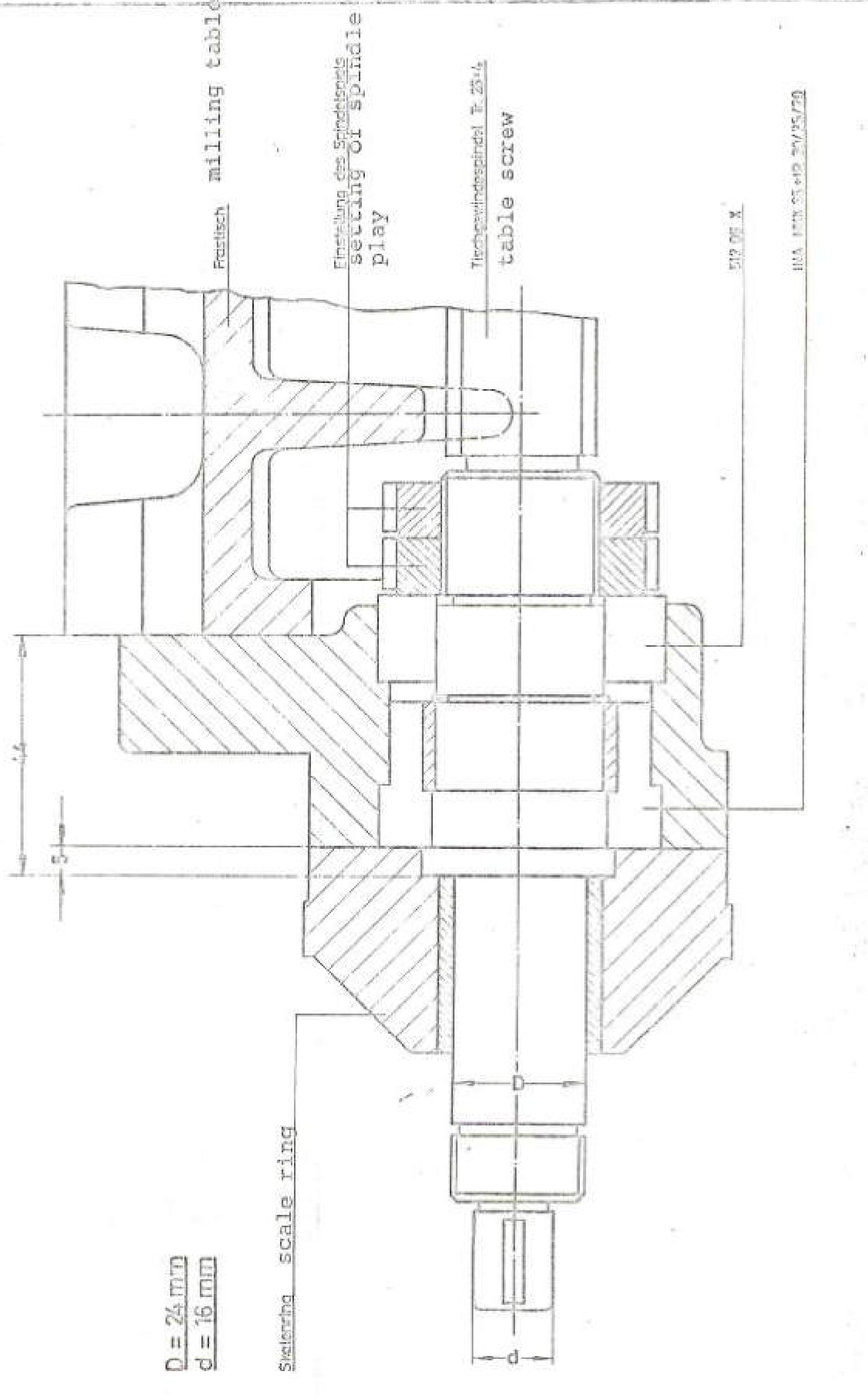


Querschnitt Frästisch

Cross section of the milling table

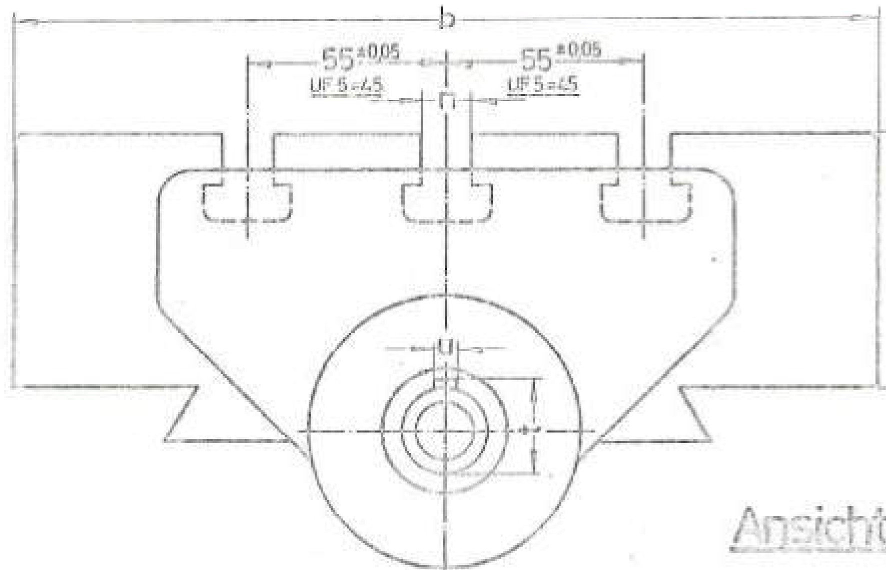


Frästisch linke Teilansicht
Left side view of the milling table



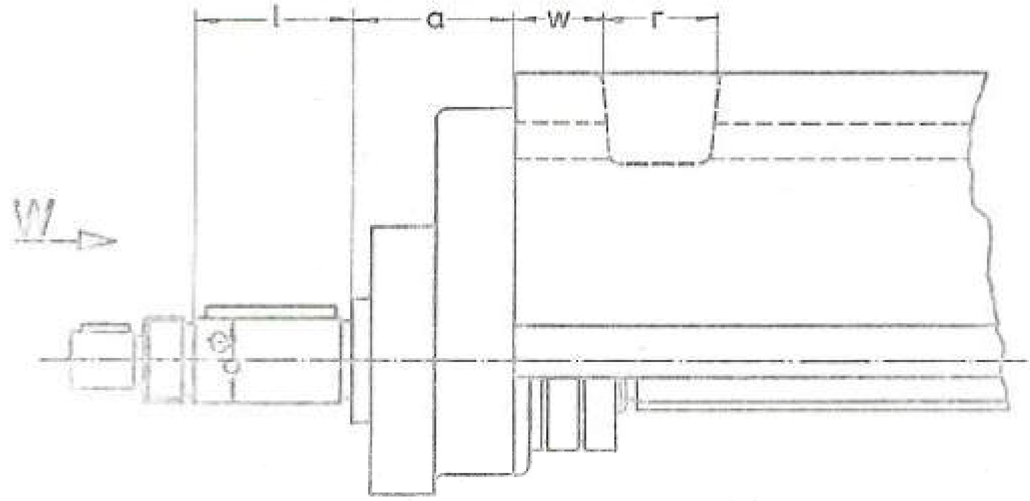
Anschlußmaße des Frästisches für Teilapparate

Measurements of milling table for deviding attachments



Ansicht W

View W



Pitch of table spindle thread — table si[z]

UF5/VF5

a	d_{h5}	l	t	u_{h9}	n^{H7}	b	w	r	Steigung des Tischspindelgewindes	h	Tischgröße
44	24	46	26,5	6	12	200	30	30	Tr 26x4	55	200x760

UF6/UF7/VF6/VF7

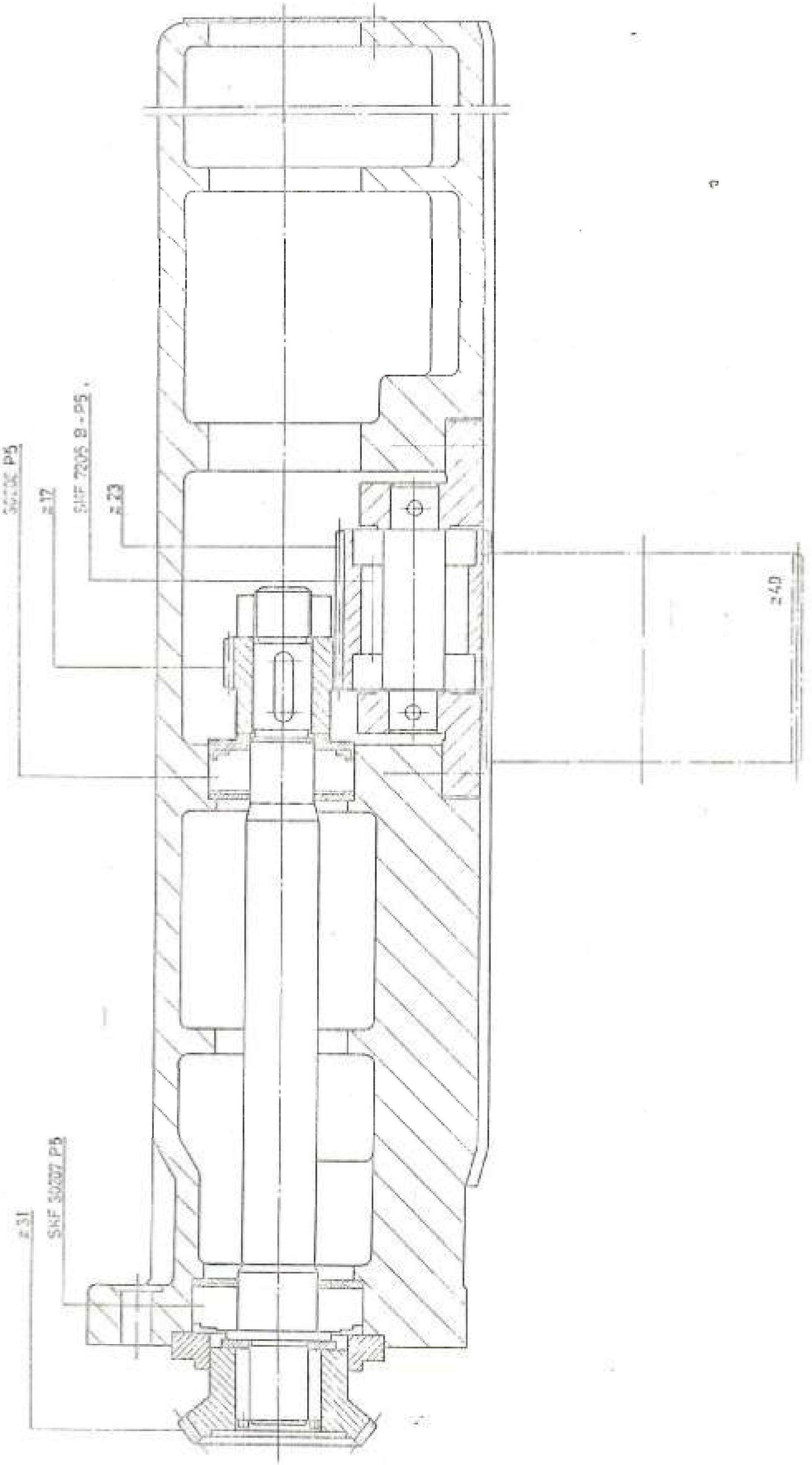
a	d_{h5}	l	t	u_{h9}	n^{H7}	b	w	r	Steigung des Tischspindelgewindes	h	Tischgröße
44	24	46	26,5	6	14	240	30	30	Tr. 26 x 4	70	240 x 860

Longitudenal section through milling head holder assembly

Längsschnitt durch Fräskopfhalter kombiniert

HF4 UF567

Blatt: 36

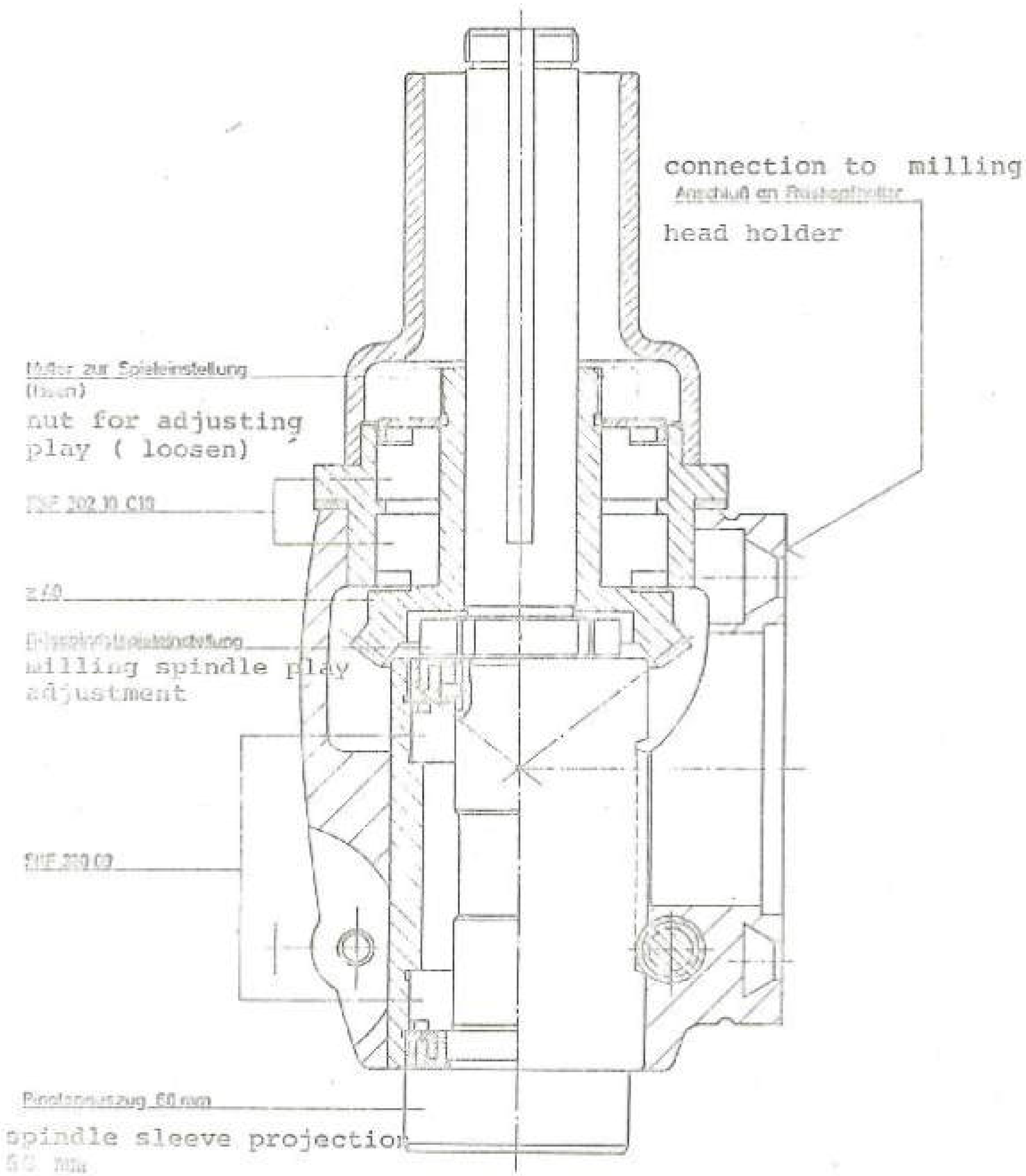


Vertical head drive and bearings

Antrieb u. Lagerung des Vertikalkopfes

MF4UF 5-6-7

Blatt: 37

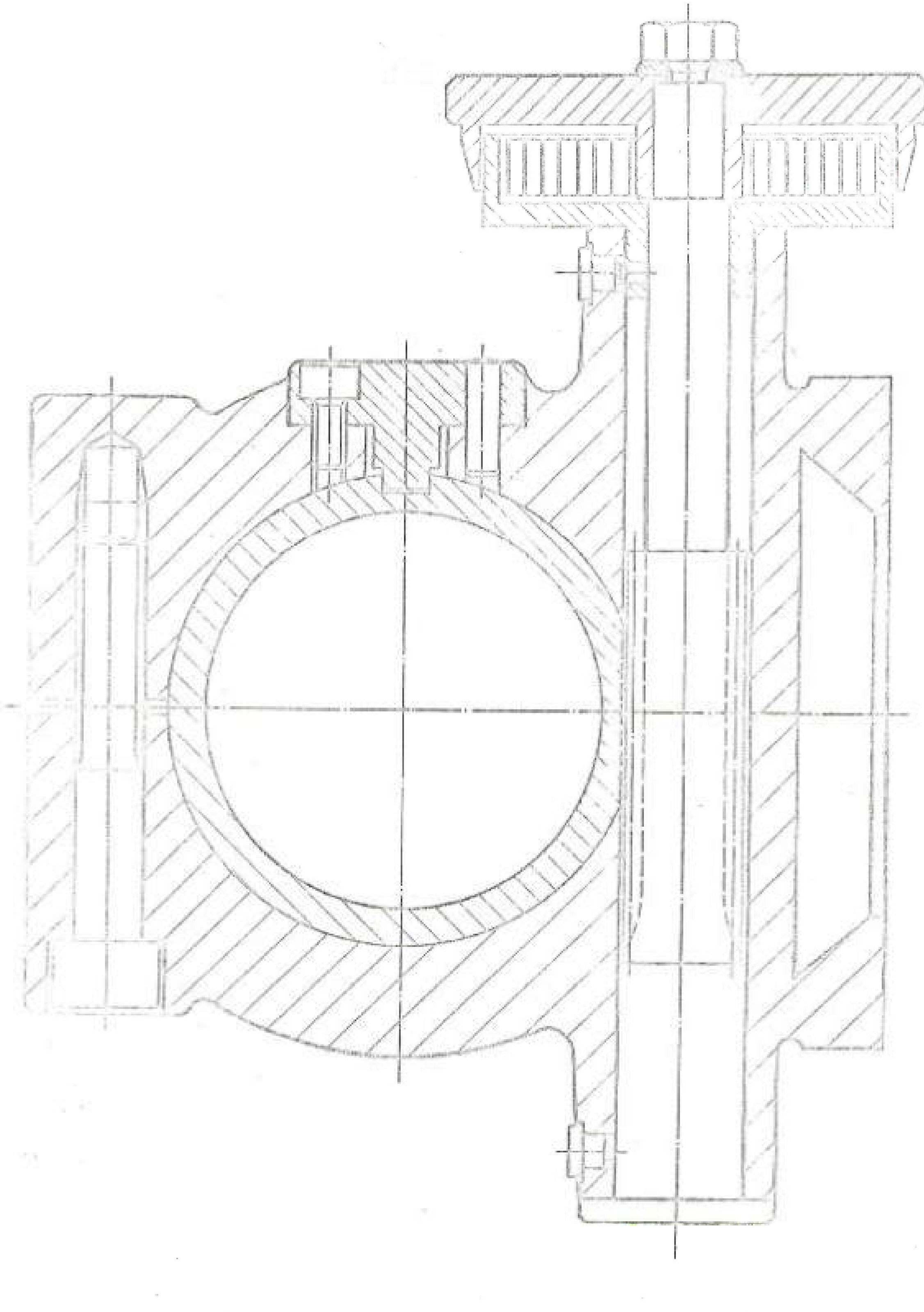


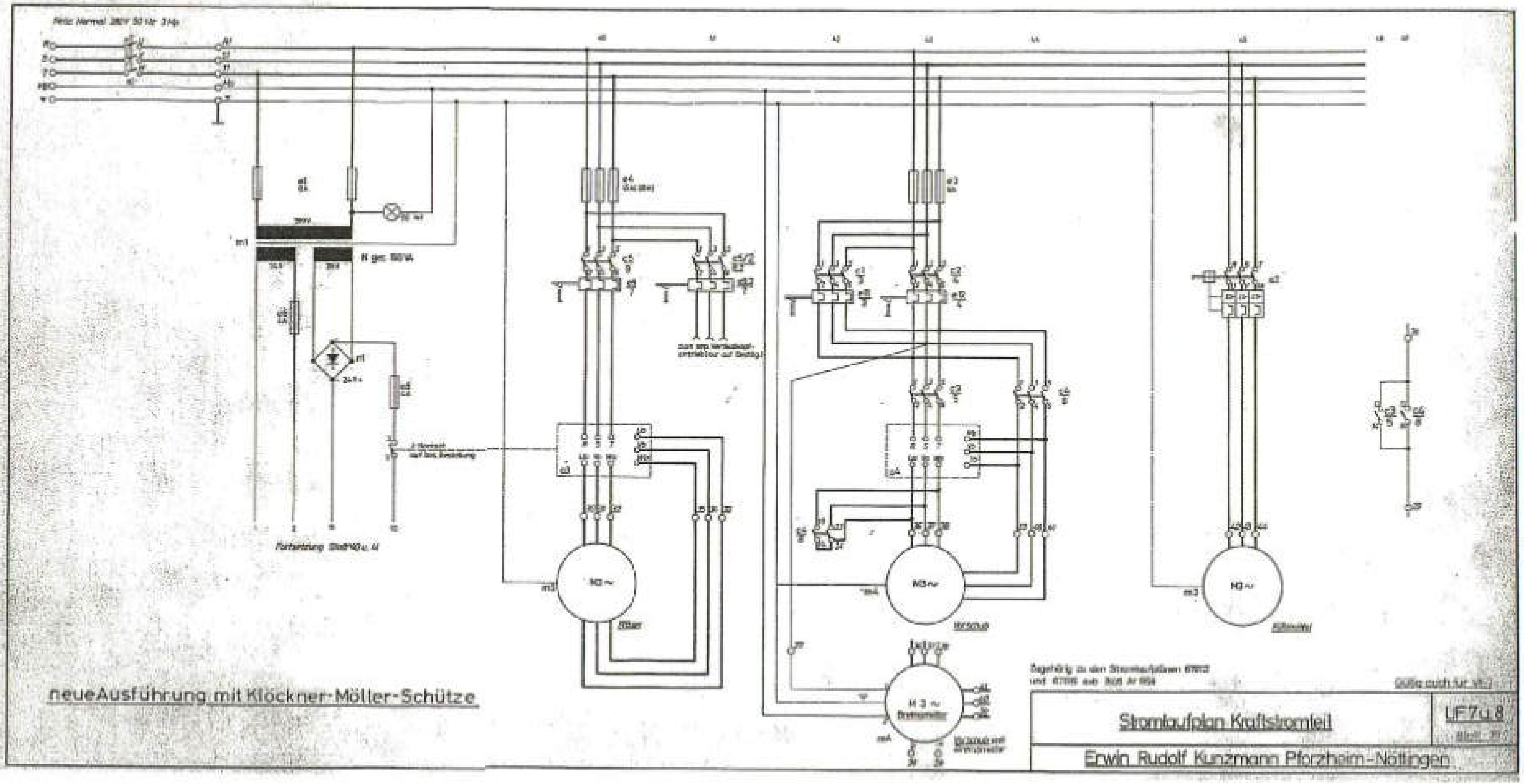
Querschnitt durch die Pinolenbewegung

Cross section through quill travel

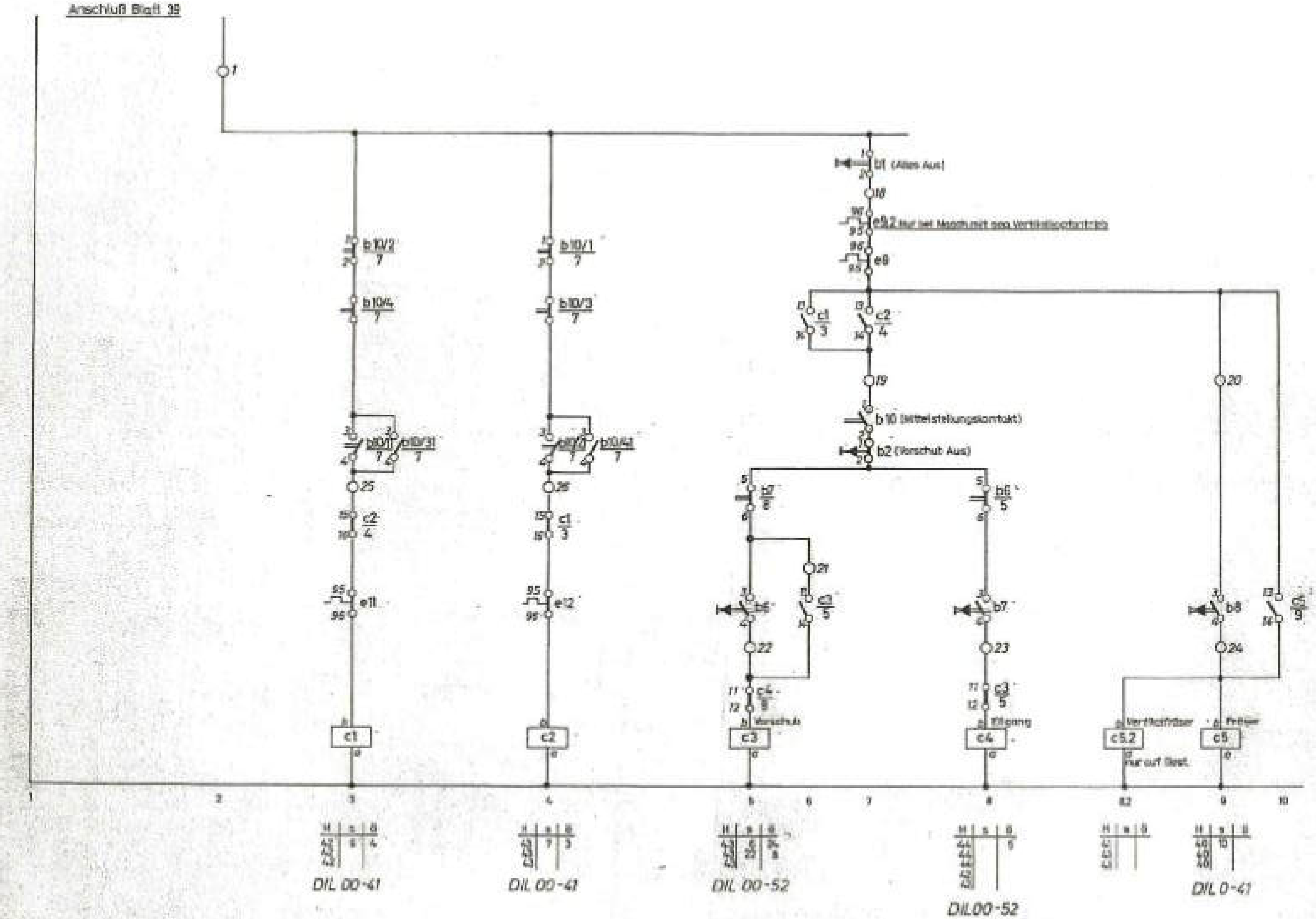
UF 56.7

Blatt:38




neue Ausführung mit Klöckner-Möller-Schütze
Stromlaufplan Kraftstromteil
UF7u.8
Erwin Rudolf Kunzmann Pforzheim-Nöttingen
M3 ~
N gec. 150 VA

Anschluß Blatt 39

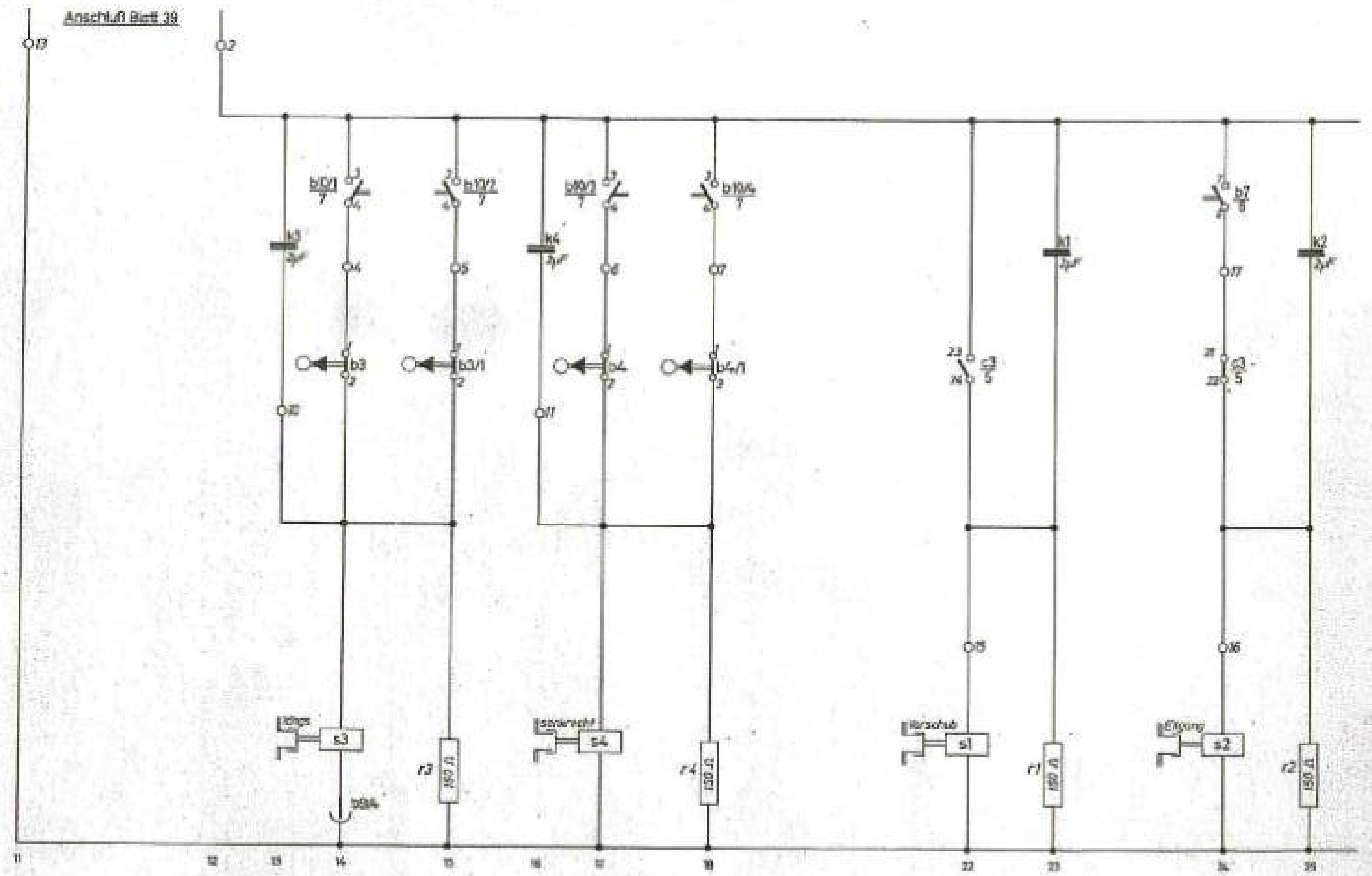


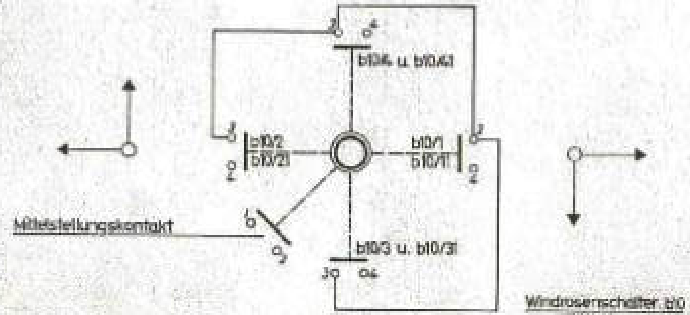
Gültig auch für VF7

(nach Grundschaltplan 670328)

neue Ausführung mit Klöckner-Möller-Schütze

Stromlaufplan-Steuerung	UF7 Blatt: 40
Erwin Rudolf Kunzmann Pforzheim-Nöttingen	





neue Ausführung mit Klöckner-Möller-Schütze

Gültig auch für VF 7

Stromlaufplan-Gleichstromteil	UF 7 Blatt 41
Erwin Rudolf Kunzmann Pforzheim-Nöttingen	

ELECTRICAL COMPONENT LIST I

a 1 Mains master switch

a 2 Motor circuit breaker for coolant pump

a 3 Pole changer switch (Dahlander switch) for main and milling motors

a 4 Pole changer (Dahlander) switch for feed motor

b 1 "All off" push button for milling spindle and feed

b 2 "Off button for feed

b 3 and 3/1 Precision cam operated limit switches for longitudinal movement

b 4 and 4/1 Precision cam operated limit switches for vertical movement

b 6 "On" button for feed

b 7 "On" button for rapid movement (non-locking)

b 8 "On" button for milling spindles (horizontal and vertical)

b 9 Plug unit on milling table

b 10 Multi directional feed selector switch

c 1 Motor relay for direction of feed motor rotation (anti-clockwise)

c 2 Motor relay for direction of feed motor rotation (clockwise)

c 3 Motor relay for feed

c 4 Motor relay for rapid movement

c 5 Motor relay for milling spindle

e 1 Fuses, 6 Amp, for transformer primary

e 3 Fuses, 6 Amp, for feed motor

d 4 Fuses, 15 Amp, for milling spindle motor

e 6 Fuse for 24 V AC control (transformer secondary I)

e 8 Fuse for 24 V DC (magnetic clutch supply)

e 9 Bimetallic relay as thermal circuit breaker for milling spindle motor

e 11 and 12 Bimetallic relay as thermal circuit breaker for feed motor (clockwise/anti-clockwise)

h 1 Telltale lamp for mains master switch

Electrical component list II

k 1 MP capacitor for feed

k 2 MP capacitor for rapid movement

k 3 MP capacitor for longitudenal movement

k 5

m 1 Control and magnetic clutch supply transformer

m 3 Coolant pump motor

m 4 Feed motor

m 5 Milling spindle motor

n 1 Selenium rectifier for magnetic clutches

r 1 Protective resister for feed clutch

r 2 Protective resiator for rapid movement clutch

r 3 Protective resistor for longitudenal movement clutch

r 4 Protective resistor for vertical movement clutch

s 1 Electromagnetic disc clutch for feed

s 2 Electromagnetic disc clutch for rapid movement

s 3 Electromagnetic gear clutch for longitudenal movement

s 4 Electromagnetic gear clutch for vertical movement

u 1 Optional machine light with switch

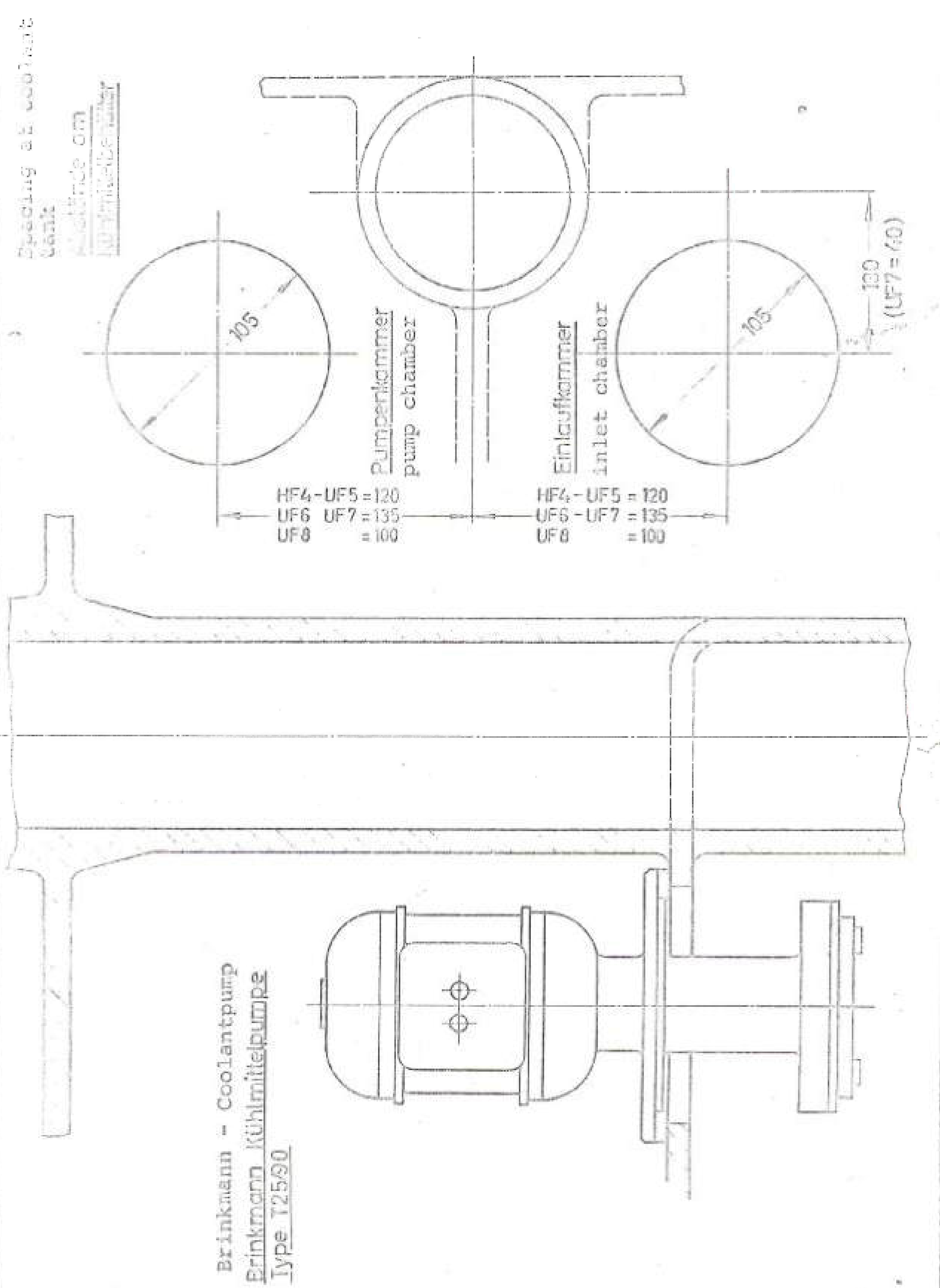
Terminals 1 - 26 for control and magnetic clutches

Terminals 30.- 44 for power circuit (output to motors)

Terminals RST Mp distributors for power circuit

Kühlmitteleinrichtung I

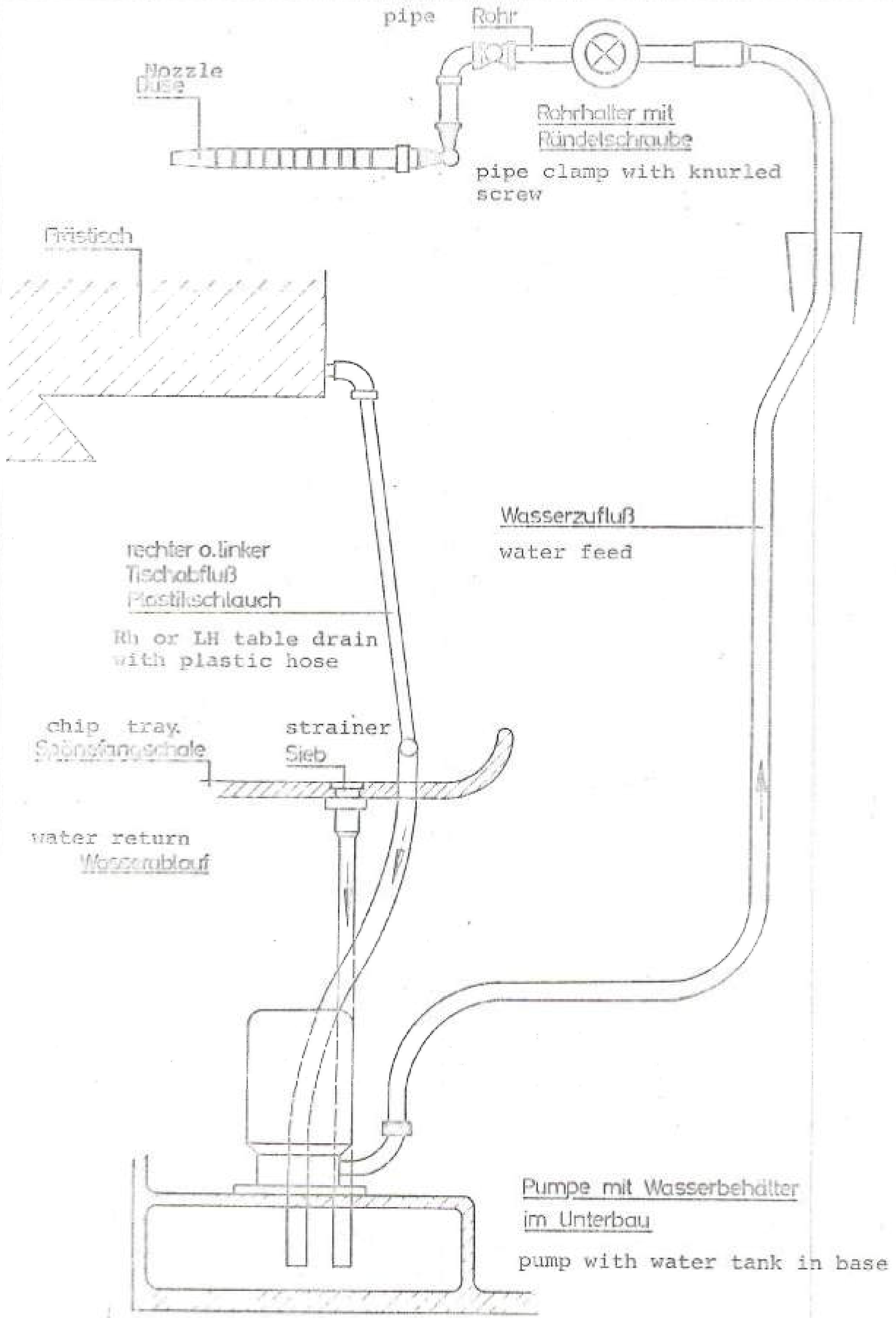
Coolant supply unit I



Kühlmitteleinrichtung II

Coolant supply unit II

HF-4, VF-5,6,7
UF 5,6,7,8
Blatt: 45

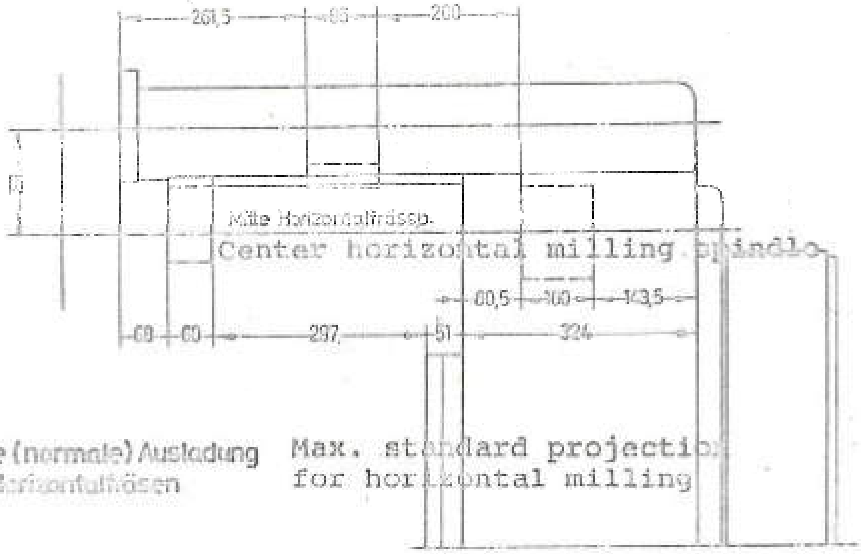


Gegenhalterstellung beim Horizontalfräsen

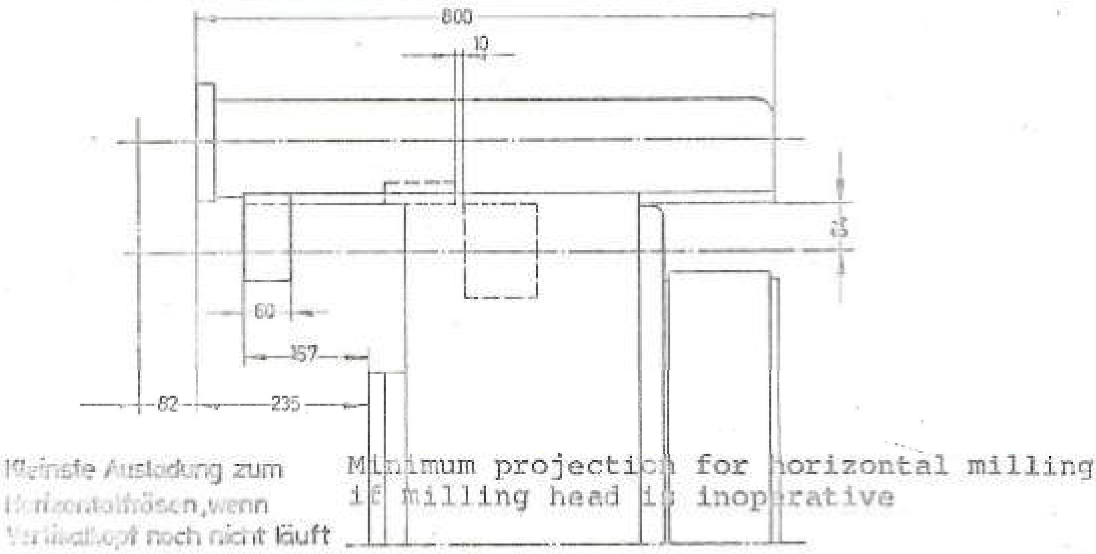
Overarm position for horizontal milling

Blatt: 46

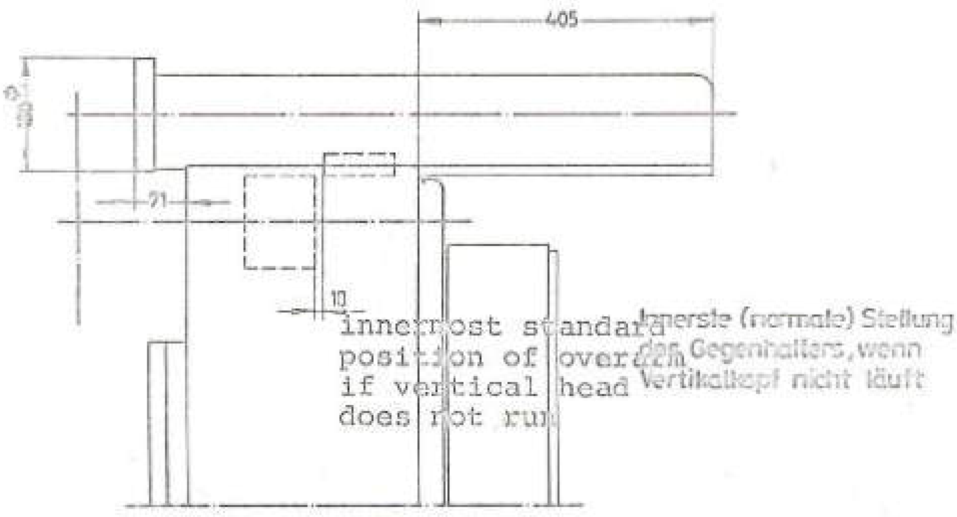
A



B



C



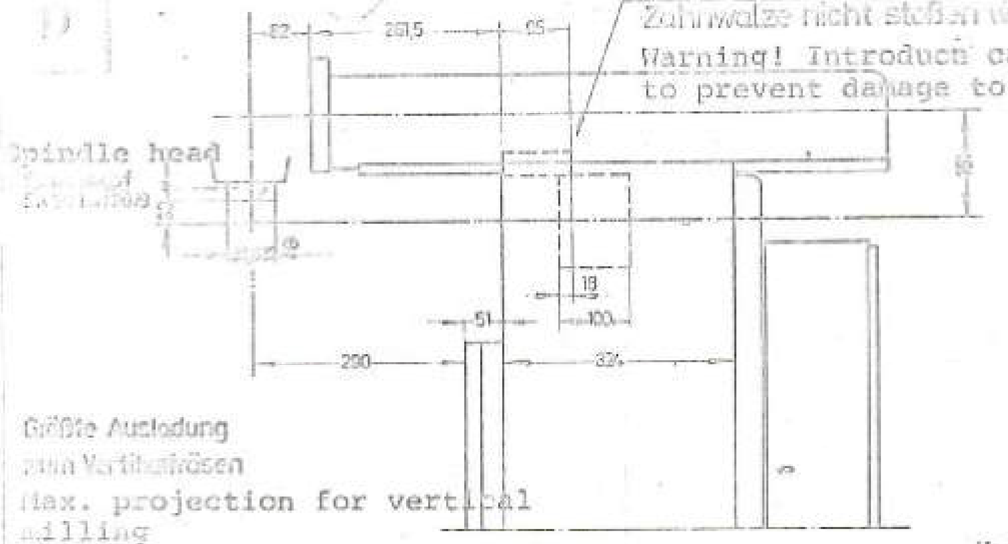
Counter stop positions for vertical milling

Gegenhalterstellung beim Vertikalfräsen

D

Achtung! Beim Einschieben in Zahnwalze nicht stoßen wegen Zahnkanten

Warning! Introduce cautiously to prevent damage to the teeth



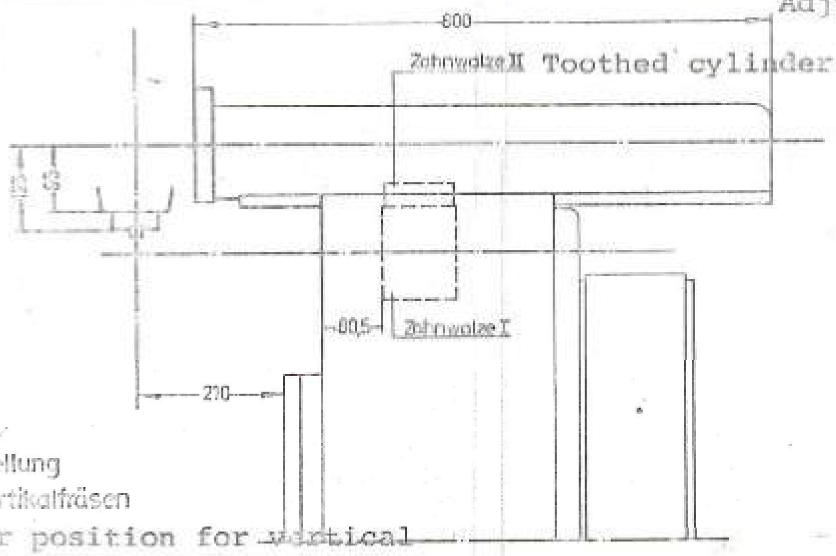
Größte Ausladung zum Vertikalfräsen

Max. projection for vertical milling

Verschiebeweg: 160

Adjustment rate: 160

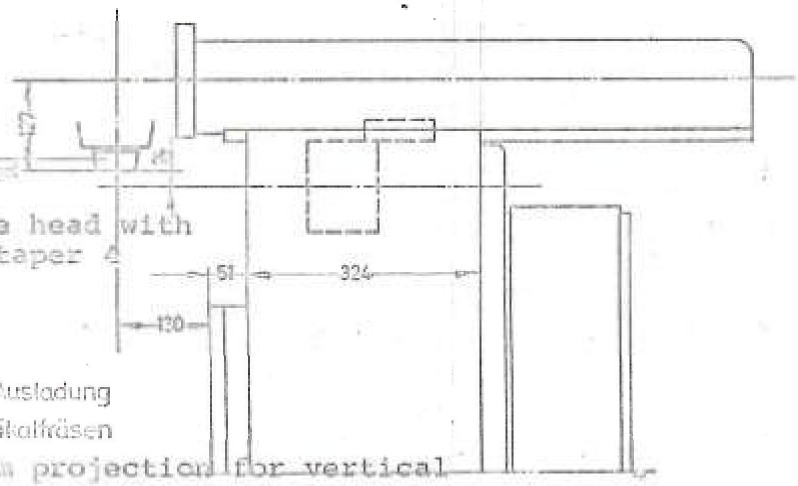
E



Mittelstellung zum Vertikalfräsen

Center position for vertical milling

F



Spindle head with morse taper 4

Kleinste Ausladung zum Vertikalfräsen

Minimum projection for vertical milling